The Iron A

A Review of the Hardware, Iron and Metal Trades.

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Portable Engine.

The J. C. Hoadly Company, of Lawrence, Mass., manufacture a line of portable en-gines which are worthy of note. Our illus-tration represents the nine horse-power. It is mounted on wheels with 21/2 inches face when of wood, or it can be had with a wagon liaving iron wheels 5 inches face. The axles are of iron, and the boiler has ashpan, a seat for the driver with a foot-board, suction-hose, strainer, etc. All the con-veniences in fact are furnished with the machine.

The engine itself is of the horizontal pattern, carried on the boiler which serves as frame. A balanced piston valve is used, and by means of an eccentric of variable throw, regulated by a governor in the flywheel an automatic cut-off is obtained. The cylinder is steam jacketed, the guide bars chilled iron, with ground surfaces arranged to admit of careful adjustment.

The check is fitted with a patent stop

valve, for closing the passage to allow the removal of the check-valve for wiping, if obstructed, without danger of bursting pump

or pipes on starting the pump.

The manufacturers say that the engine under favorable circumstances, with attention can be run so as to develop a horsepower with the consumption of 3.2 pounds of coal per hour, and while they do not expect this economy to be attained in ordinary practice, they say that with good care the con sumption should not be more than 3.5 pounds of coal per horse-power per hour. Messrs. R. H. Allen, of 189 Water street, are the nts in this city.

Double-Acting Spring Butt.

The Sabin Manufacturing Co., Montpelier, Vermont, are making a double-acting spring butt which they claim has several very important advantages. These butts, of which we publish two illustrations on this page, are made with but two leaves. In order to obtain greater strength and steadiness in holding the door they are made with strong flances at right angles to the with strong flanges at right angles to the leaf, this results in an additional gain, as the screws can be driven from the outside instead of going into the edge of the door The butt can be put on without opening the leaves and without the use of a strip between leaves and without the use of a strip between the stile of the door and the jamb. On the back of the butt is a very strong volute spring which draws in a direct line with the center of the door. This holds the door in position and at the same time prevents the tendency to sag which is frequently so annoying in doors of this kind. This butt was patented April 18, 1876.

Scientific and Technical Notes.

Experiments by Profs. Marker and Schultze show that under some circumstances the PASSAGE OF AIR AND GASES THROUGH WALLS AND BRICK WORK

is by no means difficult. All that is neces sary to means afficient. All that is necessary to promote the passage is a difference of temperature of 10 deg. between the inside and outside air. The figures given are as follows, per hour, for each square yard of wall surface: Through sandstone, yard of wall surface: Inrough sandstone, 3.7 cubic feet; through quarried limestone, 6.5; through brick, 7.9; through turfy limestone, 10.1. This fact of the penetration and flow of gases through stone has one important bearing on the construction of wholesome residences. Most people are under the impression that if a cellar is lined with Portland cement, the dampness and of the earth beneath will be shut off. If not in some way prevented, earth vapors pass upward into the building, and that part of the process is usually hastened in the winter months by a furnace in the cellar. Doubtless many malarial diseases such as typhoid fever and diphtheria, may thus be propagated in cities, especially where the building sites are imperfectly drained or are "made ground." The experiments referred to are an additional proof that a Portland cement lining will not cut off the malarious gases, as indeed might also be inferred from its porous character. The only effective barrier against foul air and dampness must be some substance which is not permeable. Probably this result might or not permeable. Probably this result might be attained by means of a layer of asphalt or bitumin, if it were evenly spread, and weighted so as to keep in place. In view of the estimate that half the diseases of mankind are preventable, it is not too much to hope that modern sanitary improvements y largely zeduce the death rate in cities; h many rezidences the improvement needs to begin at the hottom

ed.

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gs.

V. Y.

The Pennsylvania railroad have adopted a very effective method of

INDICATING THE SPEED OF TRAINS AT NIGHT by means of properly arranged signal lights. The invention was made we believe by a Mr. Needham, of Cincinnati, Ohio. It consists of a flashing light that indicates the

steadily visible; when the train moves the lights flash once for a given number of revolutions of the wheels, and thus its movement and actual speed can be easily estimated as far as the lights can be seen. In fact the distance is very accurately indicated by the disappearance of the red light, the flashing of the white light being only visible at the greater distances.

The French are experimenting in the propulsion of street cars, and Mr. Mekarski has invented a

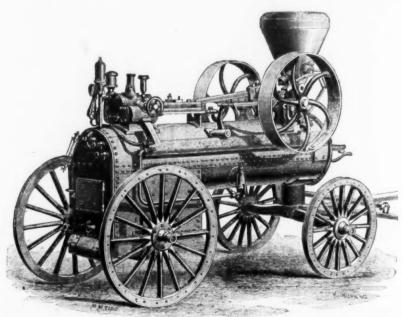
COMPRESSED AIR AND STEAM STREET CAR which has recently been tried upon a Paris
being composed of one or more cylindrical layer of tallow. The tallow prevents the the promoved the proposition and prevents the promoved the promoved the promoved the promoved the promoved

compressed Air and stream street care which has recently been tried upon a Parisian street railroad. The framing is supported on two axles, rather near together, to facilitate the passage around curves, the inventor being evidently ignorant that a care with greater spread of wheels will take a curve easier than one where the spread is

average of 4000 ships in ballast seeking cargoes, about 2600 being from Europe, and
700 from Cuba. There cleared from the
United States for countries other than
Canada an average of only about 500 ships
in ballast seeking cargoes, of which number
20 are bound for Europe, 200 are for Cuba,
80 are for whale fisheries, and the rest scattering. In other words, a vast fleet of large
ships built for the ocean carrying trade,
mostly foreign, comes to the different ports
of this country, North and South, every
year, empty; and 3500 out of 4000 of them
go away loaded with heavy cargoes, the
produce and growth of the United States.
This might be considered, perhaps, as merely
a statistical statement of a truth which has
been known in a general way to foreign
shipmasters for a long time, namely, that a
cargo can always be obtained in the United
States; but it is in all respects a striking
fact. Not only do the largest cargoes or States; but it is in all respects a striking fact. Not only do the largest cargoes go out from this county, particularly to Europe, but the largest number of cargoes; and the shipmaster cruising about the world for something to do can as certainly command a load of crain coutton provisions and more load of grain, cotton, provisions and mer-chandise on the United States seaboard as he can guano or nitrate in Peru, or coffee in Brazil. This fact speaks with a ringing voice to Americans. It declares that if they have not as large a share of the ocean carrying trade as they want, it is their own fault. Our shipbuilders are now building wood and iron ships as cheaply as the English; hence, if it is not American ships which carry American products abroad, it is because Americans cannot sail their ships as cheaply as other nations, or because they cling to the old-fashioned and expensive wooden vessels.

The Social Science Congress to convene at Aberdeen, in Scotland, this year, will treat subjects which are of paramount concern all over the world at this time. The best method of housing the laboring classes in town and country and providing for the sanitary welfare of those engaged in the coast fisheries; the principles to be observed in restoring and preserving old buildings; the effect of competition upon art progress and the introduction of art into the houses of common people will be debated; and with these topics the congress will consider the causes of depression in trade over the world now, and the effect of trades unions, strikes and lock-outs. More might perhaps be hoped from these essays and discussions but for the special theories which color all British thought concerning some of the topics. These cannot, however, govern all that is said in relation to business depression and strikes and lock-outs; and it is quite possible there may be a valuable addition to what we should know about the causes of the prolonged depression in business everywhere, which, fairly understood, will enable intelli-gent steps to be taken against them and for recovery. Each country has for some time attributed its sufferings to local causes. So long as the evil was misunderstood the attempted remedies must fail. The congress from, and all will hope that its verdict may be correct and its conclusions complete

An invention that seems likely to counter act the most frequent cause of fires that break out in the wreck of railway trains, is announced from Omaha. Such fires are in the majority of instances kindled from coals that are thrown at the time of the accident out of the stoves which are used to heat the cars, and it is easily capable of proof that the burning of railway wrecks occurs much more frequently during the seasons of the year when cars are heated than when stoves are not used. The ingenuity of inventors has been chiefly directed toward obviating this risk by making the stoves so secure as not to spill the fuel when upset, but such contrivances meet only partial success, because of the possibility that the concussion may be so violent as to break the stove to pieces. There have been several ingenious devices for obtaining heat without fuel-burning stoves, but they do not seem to have meet the want though one of them. A. Smee Ayrton a leather seller. Mr. W. T. Charley, M. P., is a loriner, and Sir Garnet Wolseley a clothworker. The clockmakers stove in which lime was slacked—was said claim four M. P.'s in Mr. Bousfield, Mr. Cob-



IMPROVED PORTABLE ENGINE.

very small. The body contains seats for sixteen passengers, while standing room is afforded for fourteen more on the rear platform of smaller dimensions for the driver. Air-tight cylindrical reservoirs for compressed air are connected together by copper pipes, and are divided into two series, the larger constituting the principal motive agency, and the smaller, of one-third the volume, constituting the reserve. On leav-



DOUBLE-ACTING SPRING BUTT.

fore starting into the heating chamber at a temperature of 338 to 356, Fah., gradually in the water. parts with its heat during the journey, so that its temperature becomes reduced to from 212 to 248, at the end of the course. In the upper part of the heating chamber, therefore, is contained a mixture of air and steam, at the pressure of the reservoirs. Instead of discharging this gaseous mixture directly into the working cylinders at a Once set the valve automatically regulates the pressure of the gases delivered to the

pressure which is necessarily variable and continually decreasing, a reducing apparatus is used by which the pressure can be adjusted. Once set the valve automatically regulates They run the same risk from heat employed in the ordinary process of tinning. Where in the ordinary process of tinning. cylinders. The driving mechanism, as we understand the descriptions, is essentially it is of consequence to avoid these evils first may be obviated by scouring with The invention was made we believe by a understand the descriptions, is essentially Mr. Needham, of Cincinnati, Ohio. It consists of a flashing light that indicates the same as that of the locomotive.

Another French gentleman, Mr. Rosseau, of Brussels, is proposing a very curious sheether it is at rest or in motion. This light is of two colors, one of them red and the other white, placed on the caboose, so that it may be seen in both directions on the line. A simple device for hiding the light at intervals is affixed to each lamp, so that it may be made to alternately appear, and by suitable gearing this is connected with one of the axles of the car. While the car is at rest the lights are nce to avoid these evils, the

ing the reservoirs, the compressed air passes or stations that each car completes or renews | Samuel Baker, and Sir Gilbert Scott are through a column of hot water, in which it becomes saturated with steam at high temperature; this water, which is introduced before starting into the heating chamber at compressed between two hydronic for taking. Samuel Baker, and Sir Gilbert Scott are returned as turners. The Marquis of Lorne water under pressure which is required to be a grocer, and the Lord Mayor a farrier. The Right Hon. Sir Richard Baggallay and some starting into the heating chamber at comprised between two hydrants for taking Sir Moses Monteflore are merchant taylors, in the water.

Sir Moses Monteflore are merchant taylors. The Solicitor General (Sir Hardinge S. Gifford) and Mr. Sergeant Robinson are sad-Tinning Sheet Iron Goods.—On the authority of an English scientific paper we have the following directions for tinning sheet iron goods made up "black," or from untinned sheet iron: "In tinning and the sergestant agonts are said dlers. The Right Hon. Lord John Manners and J. D. Samuda, M. P., are shipwrights. Sir T. G. A. Parkyn is a cook, and the Rev. or from untinned sheet iron: "In tinning and Colonel Robertson is a blacksmith, and thin cast iron goods of this kind they run the risk of losing part of their substance by the filing or friction necessary for the Pim, R. N., is a needlemaker, and the rector of Grays (Essex) a vintner. Sir Edward Watkin is a wheelwright, and the Right Hon. Sir Edward

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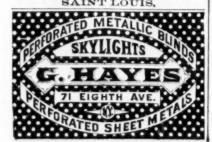
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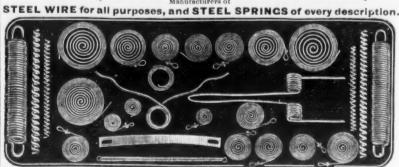
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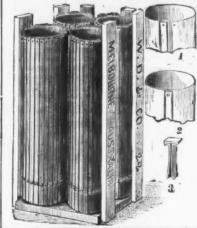
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New Patents.

We take the following abstract of new patents, recently issued, from the official

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—1. As a new article of manufacture, a molded vulcanized India rubber tire C, provided with lateral flanges a a at 10 its base, and lateral recesses b b outside or above 06 40 E said lateral flanges for the reception of lateral griping surfaces

2. In combination with the ordinary tire B and rim of the wheel, the flanged elastic tire C, griping surfaces D, and fastening

93,607.—Die for Welding Links.—J. H.

103,007.—The for Weiting Links.—J. H. Helm, Allegheny, Pa..—July 31.
The inclined planes of the die blocks and the cavities therein operate so as to concentrate the force of the movable die block upon the portion of the link to be welded, and they are so constructed that the inner line of parting of the die proper dips below, and the outer line rises above, their respective planes throughout the portions that embrace the sides of the link.

193,617.—Feed Water Heater and Pump Combined.—Delos E. Rice, Detroit, Mich.

—July 31.

The feed water heater consists of a cylindrical tank, a submerged reciprocating pump, exhaust steam inlet pipe, feed water inlet pipe, having its end covered by a perforated plate, and in line with the steam inlet pipe, team escape and overflow

193,644. Machine for Making Bolts.—Geo. Dunham, Unionville, Conn.—July 31. The feed rolls and the die rolls oscillate,

and the latter are provided with griping and angular shaping die surfaces, and carry shears. The heated bar is fed to the griping strears. The heated bar is fed to the griping surfaces of the die rolls and held, when it is seized by the upsetting jaws and upset, to provide metal for the square neck. The feed rolls again oscillate, thrusting the rod forward between the angular shaping surforward between the angular snaping surfaces of the rolls, which reciprocate toward the feed rolls, to enable that to be done. The preliminary shaping having been done, and the end of the rod having been seized by the transferring tongs, the blank is severed and carried to the holding and turning large which receive and hold while the jaws, which receive and hold, while the heading and squaring dies do their work, and turn between the two strokes of the

and turn between the two strokes of the squaring dies.
193.715.—Machine for Grinding Calender Rolls.—E. E. Latham and R. Binns, South Windham, Conn.—July 31.

By key, cams or screws bends the rails and ways of the upper carriage to correct irregularities in the ways. On one end of the carriage is a sliding shoe, in which one-way groove is cut. May reverse carriage and straighten again. May use indicator to multiply deviations.

and straighten again. May use indicator to multiply deviations.

193,926—Nail Plate Feeding Machine.—E. J. Couch, Allegheny, Pa.—Aug. 7.

The double cam groove formed by the double ring secures, through the sector and its wrist, the advance of the nail plate at each half revolution of the tubular barrel.

93,963.—Machine for Sawing Metal Bars.— Wm. R. Jones, Braddock's, Pa.—Aug. 7. The end of the rail adjacent to the saw is securely clamped by a vise while being oper ated upon. In line with the plain roller, over which the rail passes, and the vise are a series of jacks (against one of which the a series of jacks (against one of which seb back of the rail is pushed), the square faces of which serve as gauges to determine the length of rail end to be cut off. The journal boxes of the saw-arbor are balanced by a boxes of the saw-arbor are balanced by a weight and system of connecting levers. 193,973.—Time Lock.—Lewis Lillie, Eliza-beth, N. J.—Aug. 7.

A supplemental unlocking mechanism is

provided, whereby the lock can be unlocked

in case time mechanism should stop.

194,008.—Device for Opening and Closing
Doors of Furnaces, &c.—Henry A. Stad-ler, New York, N. Y.—Aug. 7.

A stepped or notched rod or bar is freely

connected by an eyebolt to the furnace door, and engages with a fixed guard or rail arranged to support said red or bar. 7834.—Machine for Forming Flanges on Boiler Heads.—R. C. Nugent, Dayton,

Ohio, assignor, by mesne assignments, to Phillips, Nimick & Co., Pittsburgh, Pa.— Patent No. 166,715, dated Aug. 17, 1875.

—Aug. 7.
The pivoted table upon which the plate to be flanged is held by a pin passing through a center hole is made concave. The frame carrying the pivoted plate is raised by means The frame orm-shafts and egmental rack to bend

The Romance of the Eddystone Lighthouse.

sineaton, on the Eddystone rocks. Lifting its gray mass above the turbulent sea near the entrance to Plymouth Sound, it has stood for a century in the pathway of the world's commerce, a monument of human genius and patience, a boast of man's superiority over the forces of nature. But nature has conquered at last. The Eddystone Lighthouse, so long regarded as one of the grandest trumphs of engineering, must come down. At the recent meeting of the British Association for the Advancement of Science, Mr. J. tion for the Advancement of Science, Mr. J. N. Douglass, Engineer to Trinity House, N. Douglass, Engineer to Trinity House, read a paper explaining the necessity for the demolition of this extraordinary work. The waves have beaten in vain against Smeaton's masonry, but they have actually

able weather, and at certain times of the tide, and owing to the exposed situation, near the entrance of the Channel, in the full sweep of the Atlantic gales, the sea often

sweep of the Atlantic gales, the sea often rises here to extreme fury, and the waves dash over the lantern at the height of 85 feet. On several occasions they have broken the glass. The first lighthouse on the Eddystones was begun by Henry Winstanley in 1696, and finished in 1699. It was a sort of wooden pagoda, on a stone base. It stood only four years, being swept away by a storm in 1703, and the builder and several workmen who had gone off to it for the purpose of making some repairs, perished at the same time. No trace of the men was ever found, and not a fragment of the building same time. No trace of the men was ever found, and not a fragment of the building remained, except a few scraps of iron. But Winstanley had demonstrated that a lighthouse could be built on this fearful ledge, and Rudyerd accordingly, who was not a professional engineer, but a silk mercer, completed another, an ingenious structure of wood and iron, in 1709. The wood seems not to have answered very well, but the building lasted until 1755, when it took fire one December night in the lantern, and the keepers were driven from room to room till keepers were driven from room to room till they reached the rock, whence (the weather being fortunately calm) they were taken off the next day.
Smeaton's great work, which has since

Smeaton's great work, which has since served as a type and model for the finest lighthouses in the world, was begun in 1756 and finished in 1759. He secured a magnificent foundation by leveling off the gneiss rock in horizontal steps, so that every course of masonry might rest upon a true horizontal bed; and to protect the ground joints still more completely from the action of the sea, he caused the lower courses to be sunk at least 3 inches in the solid rock, as in a socket. All this cutting of the foundation was done with chisel and hammer, lest blasting should loosen the rock. The materials used in the building were Portland stone and granite, laid in hydraulic cement. The blocks were a ton and two tons in weight, and carefully laid in hydraulic cement. The blocks were a ton and two tons in weight, and carefully dovetailed together, every course being adjusted on a wooden platform before the stones were carried to the rock. The courses were furthermore connected by stone dowels, and the whole firmly clamped. To find the best and strongest shape for the edifice which had to be built upon this foundation, Smoater a unlied to nature. He instituted the Smeaton applied to nature. He imitated the trunk of a tree. The lighthouse tapers gracefully to the top, with a slightly concave out-line, and its base spreads outward as if it were rooted in the rock. The upper part was originally of wood, but being burned in

1770 it was rebuilt of stone.

The enormous difficulties encountered in the execution of this work, the ingenuity the execution of this work, the ingenuity and perseverance displayed in overcoming them, and the full particulars of the plan—one of the most skillful combinations of elements of stability ever devised—are well described in Smeaton's "Narrative;" and in spite of the progress that has since been made in mechanics, the Eddystone Lighthouse has never ceased to be the pride of every Englishman and one of the maryels every Englishman and one of the marvels of engineering. If it now must be de-stroyed, the nation will have the consolation of knowing that a better building can be erected in its place. Although the sea beats in vain against its walls, it cannot be regarded any longer as a lighthouse of the first rank. There are some modern improve-ments which cannot be applied to it. Science has discovered how to throw a light so far that a building of considerably greater height than this is now required to give the proper range. A fog signal of the largest kind seems also to be needed in this position, and Smeaton's structure is too confined to hold it. But it is proposed, when the tower is destroyed, to put the stones together again and leave them as a monument on the coast. It would be an excellent thing to do. The model lighthouse should stand there, as a memorial of a great engineer and an impressive reminder of the weakness and little ness of man when he battles with the ele

Alchemical Recipes.—In their search for the philosopher's stone the old alchemists left no mixture of familiar or unfamiliar ingredients untried. In an ancient work called "The Gold Maker's Guide" we have this promising formula: "Take of the gall of a black tomcat, killed when the night approacheth, one part; of the brains of a night owl, taken from out its head when the morning dawneth, five parts; mix in the hoof of an ass when the tide turneth; leave it until it doth breed maggots; place it on thy breastbone when the moon shineth bright—and—thou wilt see a sight which the eye of mortal man ne'er beheld afore." If experiments with this recipe tended to make the nocturnal melody of the "black tomeat" less frequent in the land, the author of the "Guide" deserved so far the gratitude of his generation. Another formula reads thus: "Hide and couple in a trans-parent denne, the Eagle and the Lyon, shut the doore close so that their breath go not For more than a hundred years one of the most interesting and conspicuous objects to the voyager bound up the English Channel has been the famous lighthouse built by John Smeaton, on the Eddystone rocks. Lifting desires in the coore close so that their breath go not out, and strange ayre enter not in; at their meeting the eagle will tear in pieces and devoure the lyon, and then be taken with a long sleepe." The explanation of such riddles is simple enough when we have the key.

There is a new anæsthetic. Prof. McKendrick and Dr. Ramsay have been experimenting in England with substitution products obtained with pyridine and chinoline. The latter of these bases is extracted from quinine by means of caustic potash, but may also be procured by some of the coal-tar series of substitutions. Three grains of the chloride of chinoline introduced, into the Smeaton's masoury, but they have actually underminded the rock upon which it stands. Based "on the solid rock" is no longer an expression of stability.

The Eddystone Rocks, lying in one of the most frequented parts of the Channel, and entirely covered at high water, were long ago regarded among the principal dangers of the English coast. The difficulty of erecting a light upon them was only overcome after various trials and disasters. It is impossible to approach the spot except in the most favor-

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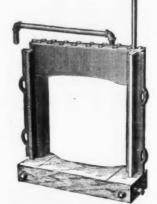
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Nearly one-half of the world requires irri gation for growing crops. In one-half the cerritory of the United States it is also re-juired. Irrigation has been practiced in quired. Irrigation has been practiced in New Mexico for more than 200 years, and it is well established in Colorado, Montana, Idaho, Utah, Arizona and Nevada, as well as in much of California. Many rules and regulations are required, because the supply of water is always in excess of the amount of and sought to be cultivated.

and sought to be cultivated.

In all old world countries weak farmers suffer. Even in Damascus, where "every drop of water runs by law," Christians are not allowed as much water as Mohammedans. The complaint is of "water being shut off above," and this, in hot, dry weather, is fatal to vegetation. In old Mexico are to be een the ruins of cities that once were flourish ing, and they met their doom because other cities were established above, taking off the

The effect of depriving a town or farmin community of water is comparable to that produced by an earthquake or plague. Every earthly prospect darkens, all kinds of busi-ness end, famine and death approach. In Italy and India government regulates the supply, but great difficulties exist upon final distribution. In no country has the system been so thoroughly studied and wisely man-aged as in Colorado, by improving upon old Moorish laws. Two principles have been added to the fundamental law of the new State constitution, which are, first, "The water of streams belongs to the people," and second, "Priority of appropriation gives priority of right." This last provision happily and forever settles the right to water of those who come first, build cities and towns, and nake rural homes.

The average cost of getting out water it oan acre. Where an isolated farmer ha to an acre. Where an isolated farmer has command of a small stream coming directly from the mountains, the cost is much less from the mountains, the cost is much less Where water is brought in long canals and over a rough country, and where dyking required, the cost is much greater. In vicinity of Ogden, Utah, is a plateau of seve ral hundred acres now covered with orchards and the cost of bringing water to it, across a valley, was over \$150 an acre. The land now sells for \$1,000 an acre. Almost always the sells for \$1,000 an acre. Almost always the canals or ditches that are to supply a number of farms are built by corporate companies which sell the water to the farmers fo about \$1.50 an acre per annum, and it is cal-culated that an inch of water delivered at 5 inches pressure, to run through the whole season, night and day, will be sufficient for one acre. In cities and towns the rate is from \$1 to \$5, and even \$10 a lot; in suburbs, from \$5 to \$10 an acre. These rates are always cheerfully paid, for the yield of crops is double, at least, to that where the dependence is on rainfall. It is seldom that water ompanies make much money.

At Greeley, Col., a new system has been established; probably it has become as nearly perfect as possible. First, the land of the colony was bought at whelesale and given to the members of the colony at cost. At the same time two large irrigating canals were dug with a common fund, and the use of the water was attached to the land in perpetuity, so that water is as much a part of an 80 or 160 acre farm as are the foundation rocks. The cost of the land and the water has been altogether, about \$13 an acre. An annual tax is laid for superintendence and repairs of about 25 cents an acre. This is for farm-ing land. For town and suburban land it is \$1 for a lot and \$1 an acre. When enlargements of the canals are made, assessment are apportioned, and the work is done by the farmers themselves. Another provisito be noted that is decidedly peculiar. water in this community is attached to the realty, a farmer may sell his water to another farmer for one year only, or several farmers may unite to exchange water-as for instance, three farmers uniting with each other for three days in the week have three times the amount of water that each would be entitled to during six days. A large volume is thus obtained and irrigation i done most expeditiously; and as grain fields require water no oftener than once in two or three weeks, the advantages of this exchange

are great.

The question of equally dividing the water was a problem that presented itself to the Greeley settlers during the first year, and so pressing was the required solution that the success of the settlement as a whole depended upon it, for when the farmers along the upper line of the canal, which is thirty-five miles long, were permitted to draw water as they pleased, those along the lower line got none, and those intermediately had an internone, and those intermediately had not so rupted supply. The difficulty lay not so much in a short supply as in a want of proper distribution, and particularly in waste. The distribution, and particularly in waste. The sense of justice in the majority of men who are unrestrained by law is not on the average high. In addition to the necessity for dividing water equitably at the flumes of the great canals, it was also necessary that it should be divided equally among farmers along the lines of main laterals, some of which are three and four miles long, while there are sub-laterals going to remote farms. One will at once see the difficulties presented, and also readily understand why disturb-Now, one the way is ances arise in Oriental countries. N of the leading farmers, who by the a literary man also, devised a method which has forever solved this vexed problem, and so great is the satisfaction given that it is

season is partly open, and at the lower end or land side is another gate, which opens horizontally. The water comes into the

equal pressure, the amount delivered from that brilliant sun, shining unclouded 300 days each flume, say for 80 acres, is equal, each in a year, they take on colors of a brilliancy equal pressure, the amount delivered from each flume, say for 80 acres, is equal, each to each, as has been demonstrated both by measuring and weighing. It appears to be the case that as mankind moves westward many old and false ideas disappear, and new ones are adopted, untrammeled by traditions and long-established customs.

Irrigation is always a necessity where the

general elevation is several thousand feet above the sea level, or where mountain ranges run across the sky so as to arrest th fall of moisture, and in each case the water used for irrigation first falls upon the moun used for irrigation first falls upon the mountains. Except in Africa, irrigation is almost always practiced in sight of mountains perpetually covered with snow. The general elevation of the plains of New Mexico is 6000 feet; of Colorado, 5000; of Montana and Idaho, 3500; of Utah, 5000; of Nevada, 4500; of the plateaus around Jerusalem in Palestine, 3000. The average amount of rainfall in the countries of the higher elevation is about 12 inches per second. vation is about 12 inches per annum; in those of the lower, 16 to 18 inches, and in these last wheat and other small grains can these hat wheat and other small grains can be grown without irrigation, providing there are winter or "latter rains," as in California and Palestine, but gardens or vegetable crops must be irrigated; also vines and fruit trees in the earlier stages of their growth. The annual rainfall of the Atlantic States is about 50 inches; of England, 55 inches. An acre of wheat requires for its maturity a depth of 10 to 12 inches of water, in the aggregate, all over the surface. This is equal to the supply on the great interior plains, but there it comes at such irregular intervals that no dependence is placed upon it except for germinating the seed of small grain, which almost always is sown early in spring, so as to receive the benefit of the last snows. Should snow or rain fall the spring, so as to receive the oeient of the last snows. Should snow or rain fall the grain must be started by irrigation, which is always dreaded, because a bare surface bakes and becomes hard, though something depends on the nature of the soil, whether andy or adobe

In preparing for irrigation two things are about equally necessary, one, a sure water supply, the other, land so situated that water an be brought upon it without too great an outlay. A preliminary line is to be run, and a surveyor is employed, who, selecting a suitable locality on a stream where a dam can be built, and where the banks are low, will, by help of an assistant, mark out a line indicated by stakes driven two or three rod apart. A proper stream should have a fall of about ten feet to the mile, and the fall of an irrigating canal should be from three to five feet to the mile. When the line has been run it is safe to reverse the work so as to correct mistakes. Thousands upon thou ands of dollars have been lost for want of this precaution, for mistakes have been made and when the excavation has been com-pleted there is no possibility of correcting the error. The real work commences by oloughing a furrow from stake to stake what is called a farm ditch to supply two or three farms can be mostly finished with the Two furrows will make a ditch large anough to carry water for 15 or 20 acres. A larger one, called a canal, is made with plows, scrapers and shovels. The contract orice of excavation is about 18 cents a cubic eard, so that the cost will be from \$300 to

\$1500 a mile. By far the larger amount of water used is or wheat, oats and barley. Where due By far the larger amount of water used is for wheat, oats and barley. Where due regard has previously been paid to selecting land, as was the case in Greeley, a vast area will be presented every way suited for being irrigated, and when the grain is well above the ground continuous fields extend along the line of the canal as far as the eye can the line of the canal as far as the eye can reach, usually without any intervening or division fences, for one common fence incloses the whole domain, while on the incloses the whole domain, while on the borders appears the brown and everlasting desert; and far away the snowy mountains, 12,000 to 14,000 feet high. The average yield of wheat is 25 bushels to the acre. Manifestly the need for water is greatest when the weather is hottest, at which time the snow melts fastest. Then the snow water rushes through morasses and rocks water rushes through morasses and rocks and dense, dark forests, bearing along elements of fertility which are carried forward to the grain fields and there deposited. In New Mexico the fertility of soil has been maintained for six generations of the most slovenly farmers. In all the little farm and garden ditches a dark deposit of rich loam two inches thick appears at the end of the season, and the chief use of manure is to give to the mineral manures washed out of the rocks what is an equivalent to vegetable

A grain field is irrigated.

submerged, every inch being reached by the water. Except in porous soils, water will not soak more than 12 inches. The farmer who invented the dividing flume has so arranged the furrows running through his fields that he has turned on the water at sun-

Plows of a particular structure have been invented for making two furrows at a time for irrigating corn, and a vast amount of for irrigating corn, and a vast amount of work is thus saved, while their execution is marvelously exact; water is let into corn by every other row, so that each row gets moisture, but this grain is never watered while young, lest it should be turned yellow and be dwarfed; but late in the season it is work is thus saved, while their execution is marvelously exact; water is let into corn by every other row, so that each row gets care is taken that the water be stopped off so soon as it reaches the further end of the row, for the ground needs to be moistened, their average yield, since vegetation need row, for the ground needs to be moistened,

elsewhere unknown. Beets and turnips grow to astonishing size, and the writer once raised half an acre of cabbage the average weight of the heads being 20 pounds, and it was impossible to place the full-sized head inverted into the largest size wash-tub. It is not uncommon to raise specimens of cab bage weighing from 50 to 80 pounds each Of course the soil is highly fertile, the cultivation is thorough, and water and brilliant sunshine do the rest. It is impossible to conceive of a more charming rural home sight than that which an acre or so of gar-den lawn and flowers presents in the summer morning after water has been allowed to run all night and then turned off, for all the leaves are covered with dew: moisture and fragrance fill the air, and birds, having come from afar, sing in the trees. Perhamuch of that which charms arises from co trast, for it will have been weeks or months since a drop of rain has fallen; the waysides are brown and sere, and the sky is the same as that over "the weary land" where the shadow of a rock is sought with eagerness.

Over the western half of our country no uestion has anything of equal importance with that of water supply. For several years the Union Pacific Railroad ran a water train nearly 100 miles through the Bitter Creek ountry, at an annual cost of \$50,000, for country, at an annual cost of \$50,000, for supplying their locomotives. At last they sank five or six artesian wells, each about 1000 feet deep, and at a cost for each of something like \$15,000. Most of them flowed from the top; in the rest water came within ten or fifteen feet of the surface. After a coar or secure of the flowing. year or so some of the flowing ones stopped; perhaps two still run. If all the water of a flowing well were saved, it would irrigate about two square miles of land, equal to 1240 acres. The United States Government spent \$10,000 on a well at Fort D. A. Russell, Wyoming, when it was found that the boring was in an old gulch filled with drift, and work was abandoned at about 1100 feet. At Denver a well was souk 800 feet, the water rose within 50 feet of the surface, the tackling broke, and work has never been re-sumed. The Kansas Pacific Railroad has spent in the same way a good deal of money, and lost it.

A few years ago General Grant recon-mended that Congress should donate a large body of land to Colorado, on condition that a canal should be taken out of the South Platte river, to be extended to the Missouri, by which 20,000,000 of acres were to be irri-A more visionary scheme never was gated. conceived, and it was quietly droppel. It is a wild estimate to say that of the 66,000,000 of acres in Colorado, its rivers bb,oco,ooo of acres in Colorado, its rivers will be able to irrigate 6,000,000; prob-ably 3,000,000 would be nearer the truth. New Mexico can water no more; the streams of Wyoming will water about the same, and those of Montana at least twice as much. But it must be understood that during any given series of years an acre of irrigated given series of years an acre of irrigated land will produce immensely more than an acre where rain is depended upon—so that population will become dense in all these far-off valleys. It should be noted that the surface of all these plains is covered with nutritious grass, capable of sustaining vast numbers of sheep, horses and cattle, while the feed is as good in winter as in summer. The rainfall of China, east of its mountain range, is probably about the same as in the Atlantic States, and yet irrigation has been established there for thousands of years. It has long been the practice to irrigate

It has long been the practice to irrigate meadows in England, and two years ago, during their distressingly dry summer, many attempts to irrigate were made, and many schemes were projected. Some rich proprie-tors laid iron pipes just below the surface of meadows, so constructed that water burst up and fell in artificial rain. Such a device is both useless and absurd, because the object sought is better attained by bringing water in ditches to the higher parts of a field, and then letting it flow for every part.

first time after the ground is fairly covered with the growing crop; the last time just before ripening, and each time the ground is On a rapid stream the best dam for turning water into a ditch is made of brush and The Mormons spent over \$10,000 in damming the Jordan a few miles from Salt Lake City, and the dam has been carried away. In parts of Ohio and Illinois artesian wells are had by boring from 40 to 60 feet, down, and returned at an easy hour in the morning, finding 50 acres completely covered.

and there irrigation should be easy. Perhaps water will, some day, be taken out of Niagara River above the Falls to water a region along the Southern shore of Lake

In the Sacramento Valley a great many

The device consists of a flume 12 feet long, to to 30 inches broad and 5 feet high, set at the bottom of the embankment and so receiving water from the bottom of the canal. At the upper end is a gate which during the season is partly open, and at the lower end or land side is another gate, which covers never receive a check. Whatever plan may be adopted you need not feel afraid of get

flume and there stands at a dead level. Now the number of acres requiring water for the season is definitely ascertained in the spring, and the carrying capacity of the canal being known, a dividend is struck, giving an equal not soaked. Gardens and lawns are watered every the number of acres requiring water for the season is definitely ascertained in the spring, and the carrying capacity of the canal being known, a dividend is struck, giving an equal definite amount for each acre. Upon a fixed bers, melons and all vines need water often —the first may be drenched every evening. In short, most vegetables take water well acres, and when the horizontal gate is opened it is set so as to correspond with the figures on the bar, and the water flows for the required acres; and as it comes from the required acres; and as it comes from dead or still water, in all the flumes with an dead or still water, in all the flumes with an dead or still water, in all the flumes with an dead or still water, in all the flumes with an dead or still water, in all the flumes with an dead or still water, in all the flumes with an dead or still water, in all the flumes and lawns are watered every every containty, giving two chances are you will not get enough. You well the chances are you will not get enough. You well ancres are you will not echances are you will not get enough. You well ancres are yo

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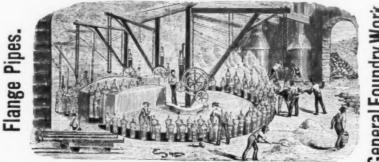
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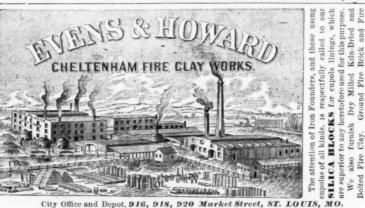
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We have been shown a very handsome We have been shown a very handsome sample of coke manufactured from Alabama coal by Mr. S. Stutz, Mining Engineer, of Pittsburgh. Some months ago Mr. J. T. Milner, superintendent of the Newcastle Coal and Iron Company, of Newcastle, Alabama, was at Pittsburgh to witness the operation of Mr. Stutz's new coal-washing machine, at the works of John Robson & Son, Fourteenth Ward and after his return sout helf a ton of works of John Robson & Son, Fourteenth Ward, and after his return sent half a ton of their coal to be washed and coked. The coal was taken from the Milner seam, which has a thickness of from 5 to 7 feet clean coal. It is a very good bituminous black coal, with cubical cleavages, dull vitreous luster, and very similar to Connellsville coal.

An analysis made some time ago by Prof. With gives the following results.

Specific gravity... Water... Volatile matter... Fixed carbon.... Ash

Wuth, gives the following results:

As can be seen from the above analysis, the amount of sulphur is very small, while the high percentage of ash being due to the presence of a great quantity of shales and thin pieces of slate mixed with the coal, require a separation of the carbon from impurities. This has been accomplished the impurities. by the washing machinery in the most perfect manner in presence of Mr. J. W. Bell, of Porter, Bell & Co., locomotive builders, representing the Newcastle Coal and Iron Company. The whole material having been crushed to very small pieces previous to its introduction into the washing box, the fine grains of coal came out of the machine entirely free from slate and sulphur, and the samples of coke manufactured from it are not surpassed by the best Connellsville. It is a very strong and hard coke, presenting an open cellular structure and will, no doubt, be well adapted for the use of blast furnaces Mr. Stutz has also washed and coked many other kinds of coal for different companies some of which contained as much as 6 per cent. of sulphur, and succeeded well in the separation of the carbon from the impurities, and in the manufacture of coke.

Asbestos and its Uses.

Recently the subject of asbestos ha attracted considerable attention, and Iron attention, and Iron has collected considerable interesting infor-

mation concerning it:

It is only quite recently that this subthis only quite recently that this substance has risen from being simply a mineral curiosity to a quasi-important article of commerce, on account of its peculiar qualities, being indestructible in fire or by neids, fibrous and capable of being woven into cloth or made into paper, often as fine as the finest flax or silk, or like spun glass, although strictly a mineral product. In early although strictly a mineral product. In early antiquity it was made the subject of curious myths and strange tales bordering on the fabulous. Practically its sole use then seems to have been for winding sheets, in which to burn distinguished dead, or to be spun into napkins which were used at exceptional feasts, and, to the astonishment of the guests, afterward thrown into the flames, to come out intact white and purified. At least Pliny mentions this; and it also At least Pliny mentions this; and it also would appear that Charles I. had table cloths made of it, which he also was accustomed to throw into the fire for the same purpose. More recently stockings and a handkerchief were made in Elba of asbestos, as gifts to Napoleon I., while living there in exile. From time immemorial the peasantry where it is found, in various countries, have turned it to economical use as an incombus tible lampwick, for which purpose its power

of capillary attraction admirably qualifies it. of capillary attrection admirably qualifies it.

Common asbestos, more or less fibrous, but of a powdery, brittle quality, is abundant in most countries, and begins to find its way into some of the industrial arts, but largely mixed with other materials. The strong, long, fibrous sorts, varying in color from pure white to dark brown, thus far are only found in sufficient quantity for commerce in the Italian Alps, at elevations of several thousand feet, and often, for much of the year, buried under the snow. They occur in serpentine rocks in irregular veins. of the year, buried under the snow. They occur in serpentine rocks in irregular veins, usually very narrow, and requiring much heavy labor and blasting to open. Sometimes, but very rarely, masses are found in one lump weighing several hundredweight. More frequently the veins prove very superficial, and give out almost at once. Then, again, they can be steadily worked for years, as they extend or penetrate into the mountain. Although some of these have been yielding as much fiber as there was a demand for since they were first opened in demand for since they were first opened in 1871-2, recently the increased call has led to the discovery of new productive veins of the very best quality, which will increase the outcome from a few scores of tons per annum to several hundreds. But the price, heretofore varying from £50 to £100 a ton, according to the quality and condition of the according to the quality and condition of the fiber, threatens to grow firmer, owing to the new uses now springing up for it, mostly based on patents, while Italian capitalists themselves begin to see the importance of a mineral of which Italy has as yet a virtual monopoly, and are preparing to manufacture it on the spot where it is found into those goods which already find a steady and increasing demand

goods which already find a steady and increasing demand.

These are chiefly steam packing in the rope or loose form for piston and pump rods, and stuffing boxes, and mill-boards for steam joints, gaskets, man-hole plates and a species of felting to cover boilers and steam pipes. The ability of asbestos to resist an elevated temperature, moisture, friction and flame itself, joined to its lubricating quality, specially recommends it for the above purspecially recommends it for the above purposes. The chief objection of the manufac-

attracting attention in America, and must recommend itself to builders generally, as rendering buildings not only safer from fires, but cooler in summer and warmer in winter and free from insects that harbor in comand free from insects that harbor in com-mon papers. These papers are made in rolls of any thickness or length, and can be colored or printed with any desirable pat-tern. Fire-proof boxes for shelves in shops can also be made of this substance, and seenery for theaters, if fabricated of it, would be impervious to flames.

The varieties of ashestos are quite aston-ishing to those who have, not made a study

The varieties of ashestos are quite astonishing to those who have not made a study of this mineral. No two localities seem to yield precisely similar fiber. In the cabinet of Mr. C. A. Wilson, Genoa, Italy, there are at least 100 distinct varieties from the Alps alone. One specimen when taken out of the

mine was 5 feet long and weighed 700 lbs.,
of the most delicate cream color, and soft,
like raw silk, after separating the fibers.
In America the asbestos business is mainly
in the hands of a Boston company, protected by some 15 patents on various goods, and begins to assume a prosperous condition, calling for increased supply of the crude arti-cle, while in Great Britain it is chiefly cen-tered in a flourishing Glasgow company, which was the first to risk the novel enterprise of trying to utilize a well-known mineral that has waited more than 2,000 years to become useful to men. In Paris it is begun to be adopted for civil and public registers in the form of a fire-proof writing paper. Recently, patents have been taken out in America and England to cover its use as a fuel-bed for petroleum in any sort of stove or engine-furnace. It absorbs and retains the oil, its capillary attraction causing it to burn only on its surface, where it is under perfect control, and gives out an intense heat. By a simple arrangement the hydro-carbons can further be converted into a gas fuel, so it is

Cryolite.

The Greenland mineral cryolite, which The Greenland mineral cryolite, which attracted so much attention some years since, but which has of late passed somewhat out of public notice, is taking a valuable position in the arts. It is found peculiarly adapted for certain descriptions of glass manufacture, and its value in this line is yet to be fully utilized. A milk-white, somewhat translucent glass has for some time past been made from the pure article, and a uniformly colored or marbled variety of opaque glass is made from the impure. For the milky variety a mixture is employed of opaque glass is made from the impure. For the milky variety a mixture is employed consisting of the following materials: One part of oxide of zinc, four parts of cryolite and ten parts of sand ore, fused in a common pipe-clay crucible, developing a large amount of fluosilicic acid. The pipe-clay is, however, not attacked much by it. This development continues throughout the fusion, and even after it, during the working, to a and even after it, during the working, to a

mall extent.

This glass possesses a considerable hardness and power of resistance, and even as a powder it is not attacked by strong acids. The properties of this glass probably depend upon the presence of the undecomposed cry-olite, for glass of the composition character-izing this, without any combination of fluorine, is transparent and not colored. Glass with a small amount of cryolite has a milky-white, translucent color and great brilliance refractive power and strength. brilliancy, refractive power and strength; with a higher proportion it becomes opales-cent, and with still more cryolite, opaque and like porcelain.

The success of Sir William Thompson's ianoforte wire apparatus for deep sea soundngs was demonstated by the United States Steamer Tuscarora, in the Pacific Ocean, Commander Belknap having aided its success by his own skill and ingenuity. There is occasion for regret that it was not used by the Challenger Expedition; if it had been, a much larger number of soundings could have been effected. Latterly several experiments have been made with this apparatus on the White Star Line of steamers between this city and Liverpool. The wire was capable of bearing a strain of eighteen miles of its own length. In these experiments a glass tube was attached at a known distance above tube was attached at a known distance above the sinker. The interior of the tube was coated with a mixture of starch and red prussiate of potash. Outside the tube was a metallic cylinder containing a solution of sulphate of iron. When the pressure of the water, at a given depth, drove in the sides of the cylinder, it forced the iron solution to a proportionate height in the glass tube, leaving its record in a blue tint. The height of the record indicated the pressure, and of the record indicated the pressure, and consequently the depth reached in sounding.

The Temeraire, one of the most powerful ironclads in the world, was commissioned at Chatham early in August, and will sail

for the Mediterranean in September. She carries four 25-ton and four 18-ton guns. The Whitehead torpedo can be fired from either side, and the ship is also supplied with outrigger torpedoes, which are to be used from steam pinnaces. Gatling guns are provided, and can be used in action from the tops, if necessary, or from boats, and they can also be used as field service guns. The thickness of her armor plating is 11 inches, and she is fitted below water with a most powerful ram. The triple of her armor powerful ram. The trials of her engines have been most satisfactory, and at the trial trip, with all her weights on board, she attained a speed of nearly 15 knots an hour. Her complement is 530 officers and men. The electric light has proved so useful on board the Alexandra flagship in the Mediterranean, that the Admiralty has given orders to provide the Temeraire with an apparatus of a similar nature.

A line of steamers has been established be-tween Marseilles (France) and the River poses. The chief objection of the manufacturer is that when properly prepared and applied it lasts too long. As covering for boilers and pipes, it saves 25 per cent. or more of the waste heat; and in domestic uses in cellars, to prevent loss of heat by radiation, it is found to reduce the temperature of the cellar 15 deg., while raising that of the house above 10 deg., i. e., it saves the furnace or steam heat, and sends it where it. furnace or steam heat, and sends it where it is most wanted.

Asbestos lining or sheathing paper, espewas needlessly lowered. The second vessel cially for wooden houses, ceilings, floors and partitions, to prevent the spread of flames first was coming into port with a cargo.

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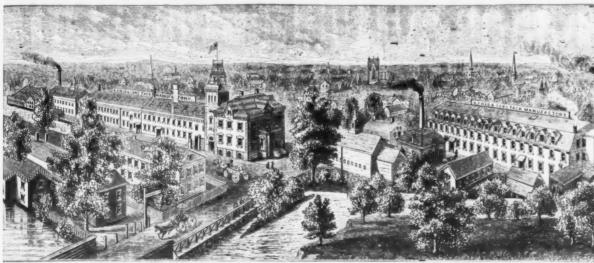
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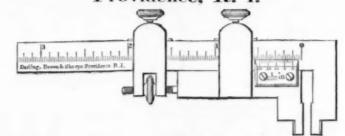
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These instruments can be furnished with millimetres (in the place of sixty-fourths of an inch), and provided with a vernier to read to one-fortieth of a millimetre,

Harvesting Machines.

BY EDWARD A. UEHLING, M. E.

Agriculture has been called "a practical xperimental science." It is certainly pre-minently practical, in a great degree xperimental, and offers a most fertile field

r the application of science.
The natural sciences—physics, botany. chemistry, etc.—are applicable and prove profitable in farming whenever called upon o assist the intelligent husbandman. Many able works have been written setting forth the advantages which would be derived if agriculture were carried on in accordance with scientific principles. Notwithstanding these noble efforts, farming in general has nly been indirectly benefited by the advan-

chnics, on the other hand, has not only d a direct bearing upon agriculture from a beginning, but in the present century has nost completely revolutionized the mode of most completely revolutionized the mode of arming. Mechanical skill and invention enius have affected means for performing ne severest labors by animal and other ower, which are thus made directly to in-rease the welfare and comforts of man.

The manufacture of agricultural implements has risen to one of the leading industries of our country. Its progress has been as rapid as its development is great. Imple-ments and tools of husbandry which less than a century ago either did not exist at all, or if they did were of the rudest and most inefficient form, are now models of beauty and perfection. Labor-saving machines, in which animal, steam, water or wind-power are employed, are rapidly and more and more generally taking the place of hand tools in which man-power is the only force applicable. Among the innumerable modern labor-saving machines there is none reater importance than the harvesting ma-

Considering that there are in the United States no less than 33,000,000 acres of cereals, yielding about 600,000,000 bushels of grain, and over 20,000,000 acres of grass, rielding nearly 24,000,000 tons of hay, to be annually harvested, it becomes evident that harvesting machines are an important factor in the political economy of our country. Nearly a million of these machines are in operation every harvest in the United States alone, embodying all the useful features of upward of 2000 patents.

The first account of a harvesting machine we have is given by Pliny the Elder, about A. D. 70, at which time it seems that reapers were in use in the Lowlands of Gaul, which he described as carts of large size with projecting teeth at the forward end, being pecting teeth at the torward end, being pushed through the standing grain by an ox. If the account given by Paladins, an Eastern prelate, born A. D. 391, who describes the action of a similar machine, may be relied upon as correct, then reapers were in successful operation more than 1500 years ago. He says: "All the ears are caught by the teeth and fall into the cart, the broken stalks being left behind the driver, who follows, regulates the elevation and depression of the teeth, and thus by a few courses backward and forward the whole who follows, regulates the elevation and lepression of the teeth, and thus by a few courses backward and forward the whole of the crank and connecting rod, but, in erop is gathered in the space of a few

After the time of Paladins nothing more is eard of harvesting machines until the idea of making available animal power for cutting grain was again revived in England toward the close of the last century. In 1787 William Pitt, of Pendeford, invented a machine whose cutting apparatus consisted of a large cylinder, from the surface of which projected numerous rows of curved teeth which hatched off the heads of the grain as the machine was propelled through

it and dropped them into a box behind.

The first patent for a reaping machine was obtained in England by Joseph Boyce on the obtained in England by Joseph Boyce on the 4th of July, 1799. Somewhat later Thomas Plucket obtained a patent for a reaping machine in which the cutting apparatus con-sisted of a plain circular disk, which was suspended below and forward of the axle,

supported on two large wheels.

About the year 1800 Mr. Gladstone, of Castle Douglas, invented a machine which had, in addition to the smooth-edged rotary cutter, numerous teeth projecting into the standing grain. It was the first machine in which the team was hitched in front, and the first which had a delivery attachment.

The reciprocating cutter, the most impor-tant principle even of our modern machines, was first brought out by Mr. Ogle, an English schoolmaster, who invented a reaper about 1822 which seems to have been simple and effective. From a short trial it was esti-mated that it could cut 14 acres per day. But Mr. Ogle says "some working people threatened to kill Mr. Brown (the builder of the machine), and it was never more tried."

Hered tried that it could cut it a cres per day, very little force in doing its work, while rakes and aprons consume a considerable percentage of the total effort applied to the machine.

4th. Resistance of the knife offered by the

made with this reaper in 1828 and 1829; ance against cutting, will be touched upon one of them in presence of 50 farmers elicited from them a signed declaration, that, moved by two horses, the machine could cut an acre per hour. Although there is unquestionable proof respecting the successful working of Bell's machine in 1828, it is a well as on careful hibrication and protection against dust and crit. The two latter entirely, until England was reawakened to ing machines, the utility of harvesting machines, through the success attained by the celebrated McCormick reaper at the Great Exhibition

Agricultural Society, near Carthage, Ohio,

Hussey's reaper was rapidly introduced into several States. In 1838 he removed from Ohio to Baltimore, where he continued to

build his machine.

About this time inventors in different parts of the world became aware of the utility of harvesting machinery. A respet was invented in Odessa in 1831, one in Vienna in 1839 and one in Australia in 1845. From this time (about 1830) up to the Great Exhibition in London in 1851 nine letters patent were issued in England for reapers and improvements thereon.

Notwithstanding that all these various attempts in different parts of the world had been made to produce and introduce machines for cutting grass and grain, and although some of the machines had been, mechanically, tolerably successful, it was not until the McCormick reaper had gained not until the McCormick reaper had gained its overwhelming popularity, and thus cleared away the greatest obstacle—prejudice—that the era of rapid development commenced. From the close of the Crystal Palace in 1851, to the end of 1852, no less than 28 English patents relating to harvesting machines had been issued. In the United States the development of harvesting machines continued with increasing rapidity, so that at present about 1900 per paper. United States the development of narvesting machines continued with increasing rapidity, so that at present about 100,000 machines are annually being built, of which number from 5 to 10 per cent, are exported.

Harvesting machines may be classified according to two general principles:

A. With reference to the work for which they are designed:

1st. As reapers for cutting grain.
2d. As mowers for cutting grass.
3d. As combined machines so designed that, by a slight alteration, they may be employed for cutting either grain or grass, as may be desired.

as may be desired.

Reapers are again classified as to the mode of delivering the cut grain; as droppers, hand-rakers, self-rakers, hand-binders, self-binders and headers. These may be further subdivided with regard to their principles of motion, as we shall see further on.

B. According to structural features

ist. With reference to the number of driving wheels, as single and double drivers. 2d. With reference to the position of the cutter bar, as front cut, center-cut and rear

3d. With reference to the wheel base as a

linear and polygonal base.

In the operation of harvesting machines three distinct forms of motion are met

1st. Progressive motion, directly obtained from the motive force, which, excepting here and there an experimental trial by steam, is always animal power in propelling the machine through the grain. 2d. Rotary motion—derived from the former through one or two driving wheels; it is increased or diminished in velocity as is

required by means of gear wheels and pinions of suitable size and strength. Belts and chains are very rarely employed, except for driving the reel.

some few cases, cam movements are eni-Besides these three forms of motion.

which are common to all modern reaping and moving machines, there are others more or less complex, employed in the attachments for delivering the grain.

The resistances to be overcome in the operation of harvesting machines are as follows: 1st. That due to the transport of the bulk

of the machine, including the driver, and in reapers a variable quantity of cut grain; if the machine is a hand machine, the weight of the raker-off or binders must be added. This resistance varies with the total bulk of the machine, with the nature, condition and location of the soil, and also with the hight and width of the supporting wheels. On soft soil large and wide wheels offer considerably less resistance for the same load than small and narrow one

2d. That due to friction caused by the rub-bing of the divider shoe, guard fingers and other parts, against the stubble and the stalks of the standing grain. This resistance, though always appreciable, is gener-ally quite small; but in heavy, lodged and entangled grain or grass often becomes very considerable

3d. Resistance to be overcome in forming and delivering the gavels or sheaves. The depends, first, upon the heaviness and condi-tion of the grain; second, on the kind of delivery attachment, a dropper requiring but

In 1826 Rev. Mr. Bell, of Scotland, invented a machine for reaping grain, which is the oldest known reaper whose pattern is still in use. In this machine there is an adjustable reel, Ogle's reciprocating cutters and an endless apron for delivering the grain in a continuous swath. Various trials were made with this reaper in 1828 and 1829; one of them in presence of 50 farmers further on.

seems to have attracted but momentary attention, as it was soon lost sight of almost

6th. The inertia of the rapidly reciprocating parts, the sickle and connecting rod the success attained by the celebrated McCormick reaper at the Great Exhibition in 1851.

The attention of American inventors was directed to the importance of harvesting machines at an early period of the history of our country, and we find that a patent was granted to Richard French and J. T. Hawkins as early as 1803.

The first American reaper, which possible resistances considered above must variable resistances considered above must kins as early as 1803.

The first American reaper, which possessed nearly all the important features of the modern machines, was that of Obed Hussey, patented 1833. Hussey's machine, on account of its involving correct principles, was successful from the beginning. The first public trial took place in a harvest field in July, 1833, before the Hamilton County Agricultural Society, near Carthage Obio

[Continued on page 11.]

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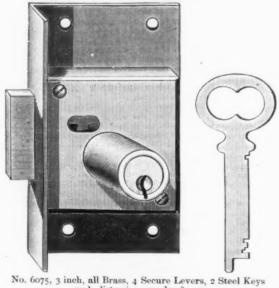
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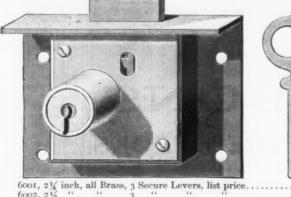
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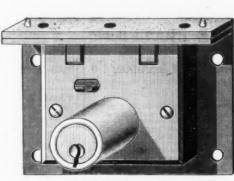




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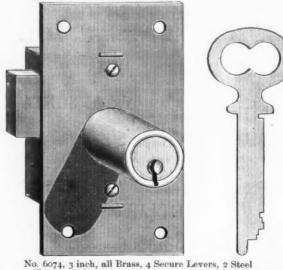
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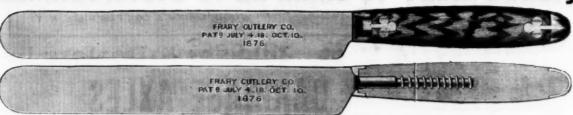


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[Continued from page 9.] Harvesting Machines.

stances, such as op grade, mellow soil, excessive moisture on the one hand and heavy, green, entangled and lodged grain on the other, together with increasing dullness of the knives, may cause the draught to be-come more than double the figures just given. The tendency with most builders, at present, is to diminish the draught of their machines by reducing the weight of them, but if the resistances due to other causes are not less-ened in the same proportion the machines may be rendered ineffective from the want of dead weight, as we shall endeavor to show further on.

Side draught is a force acting at right angles to the pole tending toward the standing grain. It is very objectionable when present in a considerable degree, requiring an additional exertion of the team to keep the machine in its right course, and extra atten tion on the part of the driver to keep the ani-mals from being crowded into the standing grain. Side draught is caused by the difference between the moments of resistance of the grain wheel and that of the driving wheel around a vertical axis through the pole. Although the resistance of the grain wheel is small as compared with that of the driving wheel, yet the lever arm of the former being many times greater (it varies in every type of machine), its movement is generally type of machine, its movement is generally slightly and in many machines considerably in excess; the side draught, which is always measured at the end of the pole, varying from 10 to 30 pounds. Anything above the latter number becomes a serious objection.

Side draught may be reduced in two ways, viz., either by diminishing the ratio of the lever arm of the grain wheel to that of the driving wheel, or by diminishing the ratio of their respective loads. The latter is by far the most advisable, since it lessens the weight on the grain wheel, where it can do harm only, and adds it where it may become useful in rendering the driving wheel more

effective.

The work done in operating a harvesting

The work done in operating a harvesting machine is found by multiplying the average draught D into the space S passed over. Algebraically expressed:

The work W=S D= $\lesssim f$ R ds.

The latter term indicates a summation of all the variable resistances already noticed. The values of f R ds cannot generally be mathematically determined, because the resistances. R being influenced by so many resistances, R, being influenced by so many different conditions, do not vary according to any known law.

Practically, none of them except the transport of the bulk have ever been determined with sufficient accuracy to justify putting them in here. In the first place, they could only be found, without considerable difficulty, by a series of very careful experiments; and by a series of very careful experiments; and in the second place, manufacturers have not yet been sufficiently impressed with the great necessity of determining just where the energy imparted to the machine is waste-fully consumed before they can intelligently makealterations toward reducing the draught

With an advance speed of 240 feet per minute, the average draught of mowers is 180 pounds; that of reapers, about 240 pounds. One acre contains 43,560 square feet; hence, for mowers whose average width of cut is 4 feet, the linear space passed over in cutting

S'=43,560 = 10,890 feet.

Calling W the work done in cutting an acre of grass and D the draft of the mower, we have from the general formula W = D S = 180 × 10,890 = 1,960,200 foot pounds per acre. For reapers cutting a 5-foot swath

 $8' = \frac{43,560}{3712} = 3712$

feet of advance motion per acre, and W'=D' $S'=240\times8712=2,090,880$ foot pounds

Denoting the space passed over per minute by S₁=240 feet, we have for the rate of work for a mower: W₁=D S₁=180×240= 43,200 foot pounds, which number, divided by 33,000, gives 1.31 horse-power exerted in operating a mower. And for a reaper we have: $W_2=D'$ $S_1=240\times240=57,600$ foot pounds divided by 33,000 gives 175 horse-

Philadelphia Mechanics Going to Kansas.—A few days ago a large meeting of workingmen was held in Philadelphia in furtherance of a scheme of colonization in Kansas. John Pinkerton presided. The first business considered was the report of the Executive Committee, in which Kansas was recommended as the spot for the asso-ciation to select for emigration. The report proceeded, viz., that the permanent association be baptized "The Fraternal Land and Home Association of the United States." Three hundred families have already applied to be enrolled among the aspirants who desire to shake the dust of Philadelphia from their feet. The plan of the Association is as follows: They will secure a deed for forty or more acres of land to any person who will pay five dollars per acre, and will agree to allow the association to improve it for the term of four years, at the end of which the deed will be returned on or which the deed will be returned on receipt of five dollars per acre and six per cent. interest. The association will also agree to cultivate any number of acres for any person who will purchase land in the vicinity of the colony, provided the buyer furnishes seeds and implements and takes one-half the crops as payment. At the end of sixlyears, if the purchaser desires, the association will agree to take the land back at what it cost, and six per cent. interest. It is also proposed to start herds of sheep, cattle and hogs, to be held intact for five years and to be cared for and fed by the colony on shares, the latter being held at \$10 per share. The herds, however, will not be started until three hundred shares are subscribed for. The report and plan were adopted. One member of the committee believed that 20,000 people in Philadelphia are ready to rush at once to the potato bugs and Colorado beetles that infest Kansas. John Pinkerton was elected permanent chairmain: Ed. M. Smith, secretary, and N. G. Thompson treasurer. After some speech-making the meeting adjourned.

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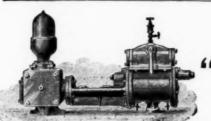
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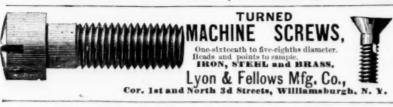




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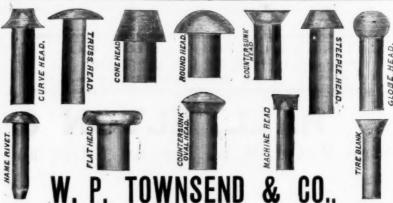
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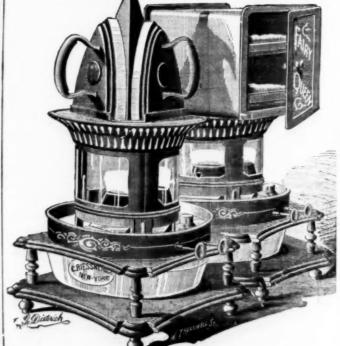
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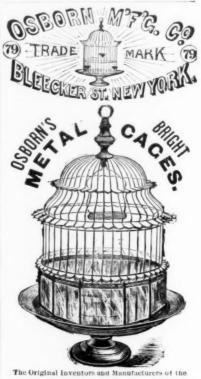
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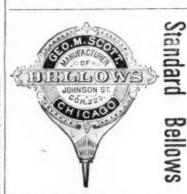
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Hardware and Metal Prices.

The Chinese in California.

Our article in a recent issue of The Iron Age entitled "A Chinese Protest against American Civilization," has called out an indignant protest from the Pacific Coast. One correspondent sends us a copy of the report of the committee of the California Legislature appointed to prepare a memorial to Congress on the question of Chinese immi gration. This we print in full on another page. After careful reading of this report we find in it nothing to change the opinions we expressed in our article. That the Chinese are an evil in San Francisco we do not doubt. The same is true of a class of the population of every city. In New York we have square miles of dens occupied alnost wholly by the vicious and those living in voluntary squalor. They are as much a class by themselves as the Chinese in San Francisco, with the single exception that they have political rights which they almost always abuse—giving their suffrages to demagogues seeking office for dishonest If a legislative committee of this State should investigate and report upon the classes in New York which in some degree correspond to the Chinese in San Francisco they could make a startling showing and one which would furnish materials for a strong argument against all immigration into the United States.

That the Chinese in San Francisco live under conditions inimical to the public health is clearly the fault of the municipal authorities. They are as amenable to local health laws and municipal ordinances as any other class of residents, and, if necessary, could properly be made the subject of special enactments-not being citizens. policing of the district would suppress any unlawful practices, and the slavery spoken of in the report can exist only with the consent of the enslaved. It is at most only ominal servitude, and we are well satisfied that there are, to say the least, thousands of Chinese on the Pacific Coast who recognize no obligation to any company or association. The moral effect of the immigration of Chinese women may be as bad as is stated, but if so it is clearly a matter of police regula-

That the Chinese are incapable of adapting themselves to the institutions of civilization because "the national intellect of China has become decrepit from sheer age," statement which lacks proof. All that China is suffering from to-day is the natural effect of centuries of national isolation. All that the Chinese people need to make them formidable competitors with the greatest producing nations of the world, is contact with a modern civilization. They are by no means idiots or beasts. What so many have become in this country is due to the conditions under which they have been compelled to live since coming here.

We now come to that portion of the report which deals with Chinese "cheap labor." We are compelled to say that much of this is sheer demagogy. The apologetic tone in which the committee speak of the acts of violence committed by the whites of the Pacific coast against the Chinese, should make every citizen of the State ashamed of his representatives in the Legislature. There is nothing which excuses the outrages that have been commit-ted by the Chinese-hating "hoodlums" of San Francisco, and that such vio lence has not been severely and promptly punished is a stain upon the records of the city. The comment of "Ah Sin" in the "Too muchee slivilized," is a bitter satire upon a kind of civilization which permits white men to gratify a lust for blood at the expense of Mongolian immigrants whose only offense is that their victims are not like themselves. The worst feature of the case is that these ruffians are to some extent sustained and encouraged by public opinion. We doubt the advantage of continuing in operation the treaties under which a wholesale Chinese immigration is encouraged. They should, in this matter, stand upon the same plane as the people of other nation If possible it would be well if the Chinese colony in San Francisco could be broken up and such of its members as are not employed at useful labor scattered where labor is wanted. The only trouble is that a majority of these people are in the wrong place Exactly the same is true of some hundreds of thousands of the people living in the bad neighborhoods of New York,

In conclusion we venture the opinion that the great outcry against "Chinese cheap labor" comes from men who do not want to work, and who, at heart, are glad of an excuse for not doing so. We also believe that the presence of Chinese labor on the Coast is of the greatest benefit to employers be not only a scarcity of labor, but the white laborers would make such unreasonable demands that nearly all the industries of the Pacific Coast would be brought to a standstill. An example of this comes to hand as we write, in a San Francisco paper which publishes the following news item :

which publishes the following news item:

We regret to see that the efforts of those who are desirous of helping the laborers on this coast are thwarted by the laborers themselves. Mr. Zaine, of Anahcim, below Los Angeles, tried the experiment of putting on white labor and discharging the Chinese he was employing in his hop fields. As he could not obtain at once all the white labor he required, he was obliged to retain some of the Chinamen. The white men soon after getting the position struck for higher wages, and a quarrel arose between them and the Chinese, which ended in driving the latter from the ground. And now Mr. Raine has to sustain a loss which he would not have experienced had he adhered to the plan under which he had been working. It is strange that men will be so blind to their own

interests as to break up the very endeavors of those who are disposed to benefit them.

The trouble with Chinese immigration is that it has not been well handled. If it had been diverted into a dozen different districts of the West it would have been absorbed with advantage to all classes of the community.

Immigration in its Bearings on our Prosperity.

The years in which immigration into the Inited States has been largest, have generally been the most prosperous. This is not wholly because of a large influx of population, but from a combination of favorable circumstances. Thus the decade which followed the discovery of gold in California was one of great progress and prosperity, while it was also one of large mmigration. Gold was discovered Febru ary 24, 1848, and on the same day Paris was convulsed by a revolution which set on fire the whole of Europe and caused valtable men of all classes of society to leave the old world for the new by hundreds of thousands. Revolution and war trampled under foot the broad grain fields of central Europe during several years in succession. supplies from here were demanded. The enormous requirements of the California markets imparted a great impulse manufacturing in the Atlantic States, and in return shipments the precious metal came pouring in from the Pacific in rapidly increasing amounts. This was the time when our magnificent clipper fleet was built, and when our fine ocean side-wheel steamers conveyed hundreds of thousands of passengers o and from California and Oregon via Panama, Nicaragua and Realejo. A similar coincidence of fortunate circumstances rarely occurs even in the history of a young nation of great energy and enterprise like our own, and none such has happened since to enrich all the States alike. If the war caused prosperity in some Middle and the Eastern States, it crippled the South for a generation, and to a certain extent the whole country still feels its disastrous consequences.

During the past few months events in have taken such an unexpected Europe turn, that a period like the one begun in 1848 may be near at hand, and what we are able to spare the Old World may be in greater demand than ever before. While Europe is thus once more on the threshold of great events, emigration from there will no doubt again assume larger propor tions, and we are likely to have our full share of this transfer of labor and capital. · Whenever a large immigration of a desir-

able nature occurs in a country like ours. real estate and the building trades are imme diately stimulated, perhaps more so than there is any reason for, especially in the great cities on the seaboard and on the lines of travel Westward. The influx of these immigrants instead of lowering wages rather tends to advance them. The money which these people bring with them is so much added to the circulation, for these immigrant funds are most of them soon invested in lands, in stores, and in tools for a trade.

A large and valuable influx of foreigners is, under the circumstances we have pointed out, most desirable, and would assist us materially in setting everything right again. In view of the importance of the subject, we have gathered some emigration statistics which may assist in showing the general drift of the exodus from Europe since the beginning of this century:

The United Kingdom.-Total emigration from 1815 to 1875, inclusive, 8,306,720; yearly average, 138,445. This emigration was

listributed as follows:		
		Percentage.
To United States	5,391,542	66
Canada		x8
Australia		13
Other countries	246,058	3
		-
T-t-1	0 6	

Irish emigration has of late years been on the decrease, as the following figures will

SHOW .	
	English Irish nigrants. Emigrants
1865	 61,345 200,676
1866	 58,856 98,890
1867	 55,494 88,623
1868	 58,268 64,969
1869	 90,416 73,32
1870	 105,293 74,28
1871	102,452 71,06
1872	 118,190 72,76
1873	123,343 83,692
1874	 116,490 60,491
1875	 84,540 41,449

Germany.-Total emigration through German ports from 1815 to 1875, inclusive, 4,064,251; yearly average, 67,737.

Scandinavian States.—Denmark.—In 1871 there sailed from Copenhagen 6422 emigrants, 5492 of whom for the United States to for Canada, 156 for Brazil, and 1755 for Australia. Sweden.-While between 1851 and workingmen. Without this there would and 1860 the annual average of emigration was only 1690, it rose to 12,245 between 1860 and 1870. In the latter year no less than 29,003 emigrated, the number declining to 17,450 in 1871 and 13,580 in 1872. Norway. -The average between 1856 and 1865 has been 5400 annually; in 1870 it rose to 14, 288; in 1871 it declined to 12,535; it was 13,865 in 1872, 10,352 in 1873, and but 4600 in 1874.

Belgium.-There left Belgium through the port of Antwerp in 1843, 3179; in 1850, 7016; in 1860, 2442; in 1864, 5827; in 1865, 3507; in 1868, 1790; in 1869, 8873; in 1870, 126; in 1871, none; in 1872, 1403; in 1873, 6204, and in 1874, 5316.

Holland.—The departure of emigrants has been during the decade 1845-1854, 20,407 all is told, or 2041 on an average.

all of whom left for transatlantic countries. average of 4547 during the preceding five this Asiatic emigration. years.

France.—Total emigration by sea from Spaniards, 8599 Americans and 93,378 Eng- the Pacific slope. lish, Swiss and Belgians. This emigration from France was distributed as follows: from the West Coast of Africa was inaugu-To United States, 211,512; to Argentine rated during the life time of Las Casas, about Republic, 75,675; to Uruguay, 35,397; to the year 1551, and was clandestinely con-Brazil, 10,381; to Venezuela, 911, and other tinued to Cuba and Brazil as late as fifteen ountries, 7595.

Italy.-There left for transatlantic counries in 1870, 25,000; in 1871, 30,000; in 1872, 35,000, and in 1873, 45,000.

are Canada, the Argentine Republic, Uruguay, Brazil and Australasia.

Canada.—The average annual immigration may be set down at 18,000 actual settlers. There were in Canada in 1871, 498,-277 native Englishmen and Irishmen, 24,162 Germans and 2899 French in the four provinces of Ontario, Quebec, New Brunswick and Nova Scotia alone.

Argentine Republic.—There arrived from Europe, in 1868, 29,234 persons; 1869, 39,934; 1870, 41,058; 1871, 21,758; 1872, 41,002; 1873, 79,712, and 1874, 68,277. Those of 1873, the largest number on record were composed as follows: Italians, 26,778 Spaniards, 9185; Frenchmen, 7431; Swiss, 1649; Englishmen, 1588; Germans, 796, and other nationalities, 855

Uruguay.-From 1867 to 1874 the annual average immigration was 18,000, mostly Italians, Spaniards and Frenchmen.

Brazil.—The census of 1872 shows a forign population of 243,480 souls, of whom 121.246 were Portuguese, 45,829 Germans, 6108 Frenchmen, 5558 Italians and 3145

Australia.-In 1845 there arrived but 1000 English immigrants; in 1852 they had reached a total of 83,237; in 1864 the number of persons arriving had fallen to 40,000 and in 1873 to 15,000; of the latter but 1500

were foreigners. United States.-The net immigration into ountry has been as follows

Fiscal Years.	Gro	ss Number.	Annual average.
1790 to 1820		250,000	8,300
1820 to 1830		151,824	15,182
1830 to 1840		599,125	59,120
1840 to 1850		1,713,254	171,325
1850 to 1860			259,821
1860 to 1870		2,491,450	249,145
1871 3	21,350	7,803,865	
		7,803,865	
1872 4	04,806		
1873 4	59,803		
			rage, 316,130
1874 3			0-, 3,-3-
	27,498		
1876 1	69,986		
	-	1,896,782	

Up to 1871 the nationality of immigrants nto this country was as follows: English, Scotch and Irish.

The great falling off in 1874-1876 was brought about by the unfavorable advices from here regarding the labor market, and emigration to America will not be as vigorously resumed as in 1871-1873, until a marked revival in trade, industry and agriculture takes place, or an unexpected series of political events in Europe, such as war or revolution, induces a fresh exodus of

We do not possess statistics from either Portugal or Spain, nor from Austria, British India and China. Emigration from Portugal to Brazil, the Azores, Madeira, the coast of Africa and the East Indies, since Vasco de Gama discovered the route to the Indies round the Cape of Good Hope in 1497, and since the discovery of Brazil in 1499, has en on an extensive scale, considering the smallness of the home population, and it is

large to the present day.

Spain has been a continuous source of emigration since 1492, to the neglect and injury of the Peninsula, whose magnificent agricultural and mineral resources have, to a considerable extent, remained undeveloped. and which only quite recently have begun to attract attention through the extension of railroad lines all over the country. Spanish emigration since the days of Columbus, in the aggregate can hardly fall much short of the number of people who left the British I slee and the Netherlands combined; to the pres ent day large numbers annually leave Gallicia, Old Castile, the Basque Provinces, the Canaries and Catalonia, and as they are sober industrious and economical, they are classed among the most desirable immigrants everywhere. Strange to say, one of the most valuable Spansh colonies, the Philippine Islands in the Pacific, has attracted but a comparatively small number of people from the mother country. This, we believe, is mainly due to the great distance, which also to a certain degree militates against emigration from Europe direct to the Cape of Good Hope, Australasia, Chili and Peru, the West Coast of Mexico, and our own California and Oregon.

The number of coolies who left British India and China for countries in the Pacific and the West Indies and South America during the past thirty years has been notoriously in excess of the average of the six years, in-

Switzerland-The number of persons emilof half a million. Java, the Straits, Austragrating between 1868 and 1874 was 30,000, lia, the Cape, Mauritius, Trinidad and British Guiana on the one hand, and California and In 1874 only 2672 left, against an annual Peru on the other have received the bulk of

From Austria there emigrated during a number of years, dating from 1849, a great 1865 to 1874 inclusive was 342,471 souls, of many Hungarians to California and elsewhom 72,761 were Frenchmen and 269,710 where, among them mineralogists and agriforeigners. Among the latter there were culturists of note, who have contributed not 91,330 Italians, 60,432 Germans, 15,971 a little toward developing the resources of

years ago. No statistics will ever be procured to show even approximately how many negroes have thus been transferred direct to tropical countries beyond the seas during The principal countries attracting Euro- the past three hundred years, but the total pean emigration outside of the United States probably approaches four million souls at the lowest estimate.

Viewed from a general standpoint, trans atlantic emigration has been a great boon both to the mother countries from which it started and to the new regions receiving it. It has opened new sources of wealth every where, and relieved poor countries of a sur plus of population. It has stimulated navigation, commerce and industry, and infused new blood where it often was much needed

The Position of Tin Plates.

The gradual decline in iron, block tin, coal and wages, has enabled the makers of tin plates to lower their prices considerably during the past four years, thereby stimulating consumption all over the world. The art of Japanning has also made great strides since the decline in varnishes; the preserving of fruits in tin instead of glass jars, the canning of lard and provisions, as well as of garden vegetables and fruit, has assumed vast proportions; stamped tinware and tin toys have of late been introduced on an extensive scale; summer cooking-stoves have become quite popular, and require tin in large quantities; in short, it may be asserted that tin plates, so long as they remain cheap, will have an immense and constantly increasing utility. It must not be overlooked, however, that on the other hand there has been a tendency to overproduction among the plate makers in Wales, which has frequently led to mischief. Many new works have been started not financially strong enough to stand the competition of the older concerns, and their necessities have often forced large lines on the English markets at ruinous prices. Untimely speculation on both sides of the Atlantic has also frequently wrought bad results. To the maker, importer and dealer in plates, they have been a source of anxiety and loss until within a couple of months past, when an increased American consumption and a simultaneous reduction in the working time in Wales placed them once more on a safer and steadier basis. The following table shows the value, on the dates indicated, of ordinary brands at New York, in gold, per box :

Charcoal Bright\$. Charcoal Ternes,. Coke Tin Coke Ternes	July 1, 1874. 10.25 to \$10.50 9.00 to 9.50 8.00 to 8.25 7.00 to 7.75	6.121/2 to	7.37/2
Average	\$8.71 May 5, 187	\$6.58 7. Sept. 7.	
Charcoal Bright Charcoal Ternes Coke Tin Coke Ternes	\$6.62½ to \$ 5.87½ to 6	6.75 6.00 5.87½	6.62 1/2 6.12 1/2 5-75 5-56 1/4
Average	\$5.97		\$6.00

The foregoing shows that after a decline of something like 32 per cent. in little less than three years, the average price of common plates has become steady during the summer months. The demand has indeed been quite satisfactory throughout these months, and the large imports have been readily taken, so much so that a month ago the interior had become well stocked. Western dealers are expected soon to recommence their purchases for the winter trade, however. The stock at the seaboard is light at present, but dealers here will now also begin to provide for the requirements of a larger consumption. imports into the port of New York alone during the first eight months of the year have been 749,000 boxes, against 581,000 last year. In neighboring ports the increase must have been still larger, judging from the exports from Liverpool alone:

EXP	ETS FR	OM LIV	ERPOOL	FIRST	7 MONT	HS.
То			Bost'n Boxes			Total.
1877 1876 1875	457.596 520,961	114.442	87,394	84,159	59,857 59,411	951,047 803,448 909,008

from Liverpool into Philadelphia and Baltimore will be noticed. The general English export has been the following:

The rapidly growing import of tin plates

ENGLISH EXPORTS; HALF-YEAR ENDING JUNE 30-TO ALL COUNTRIES,

Boxes.

1872	1875
Boxes, 1872 2,083,451 1873 2,150,477 1874 2,143,468	Boxes. 2,448,986

The preceding statistics show that the quantity exported during the first siz months of the current year has been 214,432 boxes large, and probably does not much fall short cluding the present. But notwithstanding

this fact, and despite the reduced working these experiments cannot fail to be im- men, intimidating interpreters and wit- influences of our civilization can effect any time still adhered to in England, they seem to be making more than home consumption and export can absorb with ease; hence it is apprehended that prices there may have to give way a little, unless the fall business here should be beyond expectation brisk and leafform large import. A further decline in British prices would, of course, cause a correction of the success in the seed of the seem of things. The family related to the refractory, removing witnesses beyond the refractory, removin call for a large import. A further decline in British prices would, of course, cause a cordificulties must be overcome before the State authority. responding one here.

Nails from Old Rails.

There has been considerable crimination and recrimination in the West in regard to the use of old rails in the manufacture of nails. Some weeks since we republished from the Wheeling Intelligencer, with credit, a statement regarding their use in that city In a Pittsburgh paper, of recent date, there appeared a report of an interview with a Wheeling manufacturer, in which it was stated that the Pittsburgh mills were using old rails. We have been at some trouble to get at the facts in the case, and are informed, by parties in whose word we place the utmost confidence, that old rails are not used in the manufacture of nails at either Wheeling or Pittsburgh. The only truth in the report seems to be that after the reported succes of General Powell, at Belleville, Ill., in the use of old rails, some experiments were made in these cities, but they were so unsatisfac tory that they were not continued. A valued correspondent at Wheeling states that but three kegs were made in that city. In Pitts burgh it was found that rails were so unever that even with the best selection it was impossible to make a nail that any manufac turer would be willing to put his brand upon and not a keg was made for the market. We make this explanation in justice to the manufacturers of these two cities, as we republished the article referred to.

The approaching English trade congress to be held on the 17th of the present month, has undertaken a rather heavy programme of business. It evidently expects to influence no inconsiderable amount of legislation during the next session of Parliament. The following is the work to be done by it: 1. To amend the law of compensation to workmen in cases of accidents, so that workmen or their families may recover from an em ployer in the event of injury or death from accidents due to negligence. 2. To secure the passing of the government bill to amend and consolidate the laws relating to factories and workshops. 3. Reform of the administration of justice. 4. The codification of the criminal laws. 5. Reform of the jury law, by lowering the qualification for jurymen, so as to admit a large number of workmen to the discharge of the duties of jurymen, and provide reasonable payment for loss of time. 6. The extension of the Employer and Workmen act, 1875, to English seamen while in British waters. 7. Reform of the patent law. 8. Abolition of imprisonment for debt. 9. Compulsory certificates of competency for men in charge of steam engines and boilers.

Besides these there are several other subjects laid down for discussion. Among them are co-operation and its relation to trades unionism; representation of labor in Parliament ; overtime and apprentices ; conciliation and arbitration in trade disputes; and what should be the basis upon which an arbitration should decide the question of an advance or a reduction of wages. will also come up the question of altering the constitution of the Parliamentary Committee by extending its sphere of usefulness.

With the best of presiding officers we think this is a programme which will require for its satisfactory and conclusive discussion about seventy-five years.

The workingmen very rarely think deeply enough to get at the true philosophy of strikes, but one of the railroad engineers at Syracuse, N. Y., seems to have gone to the bottom of the matter. When urged to strike he is said to have replied as follows: "Supw and be out o pose we should sti work a month, and at the end of that time "the company should give in and let us have "but 10 per cent. advance-how much " would we make on that deal ! During the "month of strike and idleness I should lose "over \$80 to start with. Some might think "that a high figure, so cut it down to \$60. "How long will it take me to make up that "\$60 which I have lost by the strike by " recovering the 10 per cent. advance which "the strike might gain for me ? O, I've fig-"ured this thing all out. I should be just 40 "weeks, or nearly a whole year, trying to "make up what I lost by one month's idle-"ness! That is on the supposition that we come out ahead. If we don't come out "ahead, striking time is a dead loss, and if "we do come out ahead, it takes nearly a whole year before I make up what I lose. "I say, excuse me from striking!" We commend this very simple and direct line of reasoning to the consideration of workingmen generally.

We learn that the Franklin Institute is to purchase a dynamo-electric machine capable of generating electricity to furnish light to the extent of 1200 candle power. The society, we believe, intends to use the machine to experiment with such electric lights as may be offered for trial. There are many may be offered for trial. There are many questions concerning the use of the electric light industrially that a series of judicious

time still adhered to in England, they seem mensely valuable to industrial science. The machines can be generally introduced. At one time the English gas companies were very considerably alarmed lest the electric light should entirely supersede the use of gas for illuminating purposes, but with a better knowledge of the working of the machine this alarm has passed away. A good and reliable electric candle or its equivalent is much needed, and many inventors are at work upon the problem of producing one. It se the dynamo-electric machine in the production of electricity for the illumination not only of streets but private houses, and at a cost far below that of any of the common means of lighting by the use of gas, oil, can-

> We find the following very significant iten n the Pittsburgh Commercial:

The chimney glass blowers will hold out against the use of the patent "crimper," and are encouraged in their strike from the fact that in Bellaire, Ohio, the employers have acceded to the demands of the workmen, and have done away with the "crimper." The men here do not insist on throwing out the machine, but refuse to turn out any greater number of chimneys for a day's work than heretofore.

This is a new outbreak of the old war of muscle against machinery." It frequently happens that the machine for the time being goes to the wall, but in the end the workman who fights is ground to powder. Machinery is too powerful, and can "hold out." Competition is too sharp and far reaching in its effects, and if Pittsburgh is not allowed to use machinery manufacturing will prosper more in other localities. England has had numberless instances of flourishing trades utterly ruined by the narrow-minded, short-sighted policy of workmen who would not have machines brought into their

CHINESE IMMIGRATION.

Memorial to Congress from the Committee Appointed by the Last Legislature—A Powerful Summing up of the Question— The Social, Moral and Political Effect of the Evil Ably Discussed.

At the last session of the Legislature Senators Haymond, McCoppin, Pierson, Donovan, Rogers, Lewis and Evans were appointed on the part of the Senate to take stimony in relation to the effect of Chines immigration on the moral and social condi-tion of this State, and to address a memorial to Congress, embracing the result of their investigation, and praying for such legisla-tion as would seem to them to be needed. The Committee have concluded their labors and the following memorial has been pre pared and forwarded to Washington:

Under the authority of the resolutions we have inquired into the subject of Chinese immigration into the United States, and parimmigration into the Cinted states, and par-ticularly into the State of California, and into the past, present and the probable future results of this immigration upon our people, and from the evidence adduced before us, whereof a report and argument is also herewith presented, we respectfully submit the following considerations: The State of California has a population

variously estimated at from 700,000 to 800,000, of which 125,000 are Chinese. The additions to this class have been very rapid since the organization of the State, but have been caused almost entirely by immigration, and scarcely at all by natural increase. The evidence demonstrates be-yond cavil that nearly the entire immigration consists of the lowest orders of the Chinese people, and mainly of those having no homes or occupations on the land, but living in boats on the rivers, especially those in the vicinity of Canton.

This class of the people, according to the castes into which Chinese society is divided, are virtually pariahs—the dregs of the population. None of them are admitted into any of the privileges of the orders ranking above them; and while rudimentary education is encouraged and even enforced among the masses of the people, the fisherman and those living on the waters and harbors of China are excluded by the rigid and hoary constitutions of castes, from all participa-

tion in such advantages.

It would seem to be a necessary conse quence flowing from this class of immigration that a large proportion of criminals should be found among it; and this deduction is abundantly sustained by the facts before us, for of 545 of the foreign criminals before us, 100 1545 or the total of the in our State Prison 198 are Chinese—nearly two-fifths of the whole—while our jails and reformatories swarm with the lower grade

of malefactors.

The startling fact also appears that the actual cost of keeping these 198 State prisoners alone exceeds by \$12,000 per annum the entire amount of revenue collected by the State from all the property assessed to Chinese.

But the criminal element in the Chines population is very much greater than the figures above given would indicate, for conviction for crime among this class is extremely difficult. Our ignorance of the Chinese language, the utter want of comprehension by them of the crime of perjury, their systematic bribery and intimidation of witnesses, and other methods of baffling judicial action, all tend to weaken the authority of our laws and to paralyze the power of our courts

rium in imperio, that undertake and actually administer punishment, not unfrequently of death. These tribunals exercise the power experiments will answer. The result of of levying taxes, commanding masses of

our youth, is exhibited in the testimony. Its disgusting details cannot, for obvious reasons, be enlarged upon in this memorial. These women exist here in a state of servi tude beside which African slavery was a beneficent captivity. The contracts upon which their bodies are held, under this syseems to be a possibility of the near future to evidence, and, we submit more than sustain what might otherwise be regarded as an extravagant deduction

The male element of this population, where not crimnal, comes into a painful competi-tion with the most needy and most deserv-ing of our people—those who are engaged, or entitled to be engaged, in industrial pursuits in our midst. The common laborer, the farm hand, the shoemaker, the cigar-maker, the domestic male and female and workmen of all descriptions find their variou occupations monopolized by Chinese labor, employed at a compensation upon which white labor cannot possibly exist. Amelio-ration of this hardship might be possible to a limited extent if the proceeds of this labor were invested in our State, distributed among our people, and made to yield a revenue to the government for the protection afforded by it to this class of our population. But the reverse is the fact, for o six hundred millious of taxable property in the State in the last fiscal year, but on million and a half was assessed to Chinese Thus one-sixth of the entire population pay less than one-four-hundredth part of the rev enue required to support the State govern ment.

And, in addition to this alarming fact, w And, in addition to this alarming tack, we find that, of the one hundred and eighty millions, if not more, earned by them during their continuance here, the whole is abtheir continuance here, the whole is abstracted from the State and exported to China; thus absolutely impoverishing n stead of enriching the country affording them an asylum. The sharp contrast be tween the results of that kind labor and of white labor, with its investment homes, its accumulation of wealth and additions to our revenue must be obvious, even to a partial mind. Fertile lands that scarcely require tillage to produce a harvest are lying idle, partly because the laborer that would purchase and improve them can earn nothing above a bare support where-with to buy, while the Chinese, who can by their habits of life practically subsist on nothing and save money, export their savings instead of here accumulating property. What the \$180,000,000 of solid gold shipped from California to a foreign country we produce if retained here by white labor and invested in the soil, in the homes and firesides of our own race, requires no illustration or argument. California, instead of tion or argument. California, instead of being a State of cities, might be a State of prosperous farms; instead of being in a condition (considering her extraordinary natural advantages) of wonderful and healthy pro gress, we find her so retarded in her growth as to amount almost to retrogression.

It is a trite saying, however, that competition in labor is healthful. True; but not between free and slave labor, and the Chinese in California are substantially in a con dition of servitude. Ninety-nine one-hundredths of them are imported here by large Ninety-nine one-huncompanies under contracts to repay to the importers out of their labor the cost of their transportation and large interest upon th outlay, and these contracts frequently their subjects for long periods. Durin During the existence of these contracts the Chinese are to all intents serfs, and as such are let out to service at a miserable pittance to perform the labor that it ought to be the privilege of our own race to perform. Even were it possible for the white laborer to maintain exist-

nature, by instinct, by the traditions of their order for thousands of years, serfs. They order for thousands of years, time. Departure from that level with them is never upward; the only change, apparently, is from servitude to crime.

The pious anticipations that the influence of Christianity upon the Chinese would be salutary have proved unsubstantial and vain. Among one hundred and twenty-five thou of them, with a residence here beneath the elevating influence of Christian precept and example, and with the zealous labors of earnest Christian teachers, and the liberal expenditure of ecclesiastical revenues, we have no evidence of a single genuine conversion to Christianity, or of a single instance of an assimilation with our manners or habits of thought or life. There are few, painfully few, professing Christians among them, but the evidence confirms us in asserting that, with these, the profession is dependent to a creek evidence. ent, to a great extent, upon its paying a profit to the professor. Those Christians who hailed with satisfaction the advent of the Chinese to our shores, with the expecta that had professed Christianity a hundred of our own youth, blighted by the degrading contract of their presence, have been swept into destruction

creation. So that whatever improvement might otherwise be anticipated from instill The Chinese females who immigrate into this State are, almost without exception, of the vilest and most degraded class of abandoned women. The effect of this element in our midst, upon the health and morals of precluded.

Above and beyond these considerations however, we believe, and the researches of those who have most attentively studied the Chinese character confirm us in the consideration, that the Chinese are incapable of adaptation to our institutions. The national intellect of China has become decrepit from sheer age. It has long since passed its prime and is want in the constant of suppressing any traine resembling the constant of suppressing any traine resembling the slave trade, convince us that an appeal to that country would lead to the desired result. Indeed, we may well assume, in view of the amicable relations existing between the English and is want in the constant of t prime and is waning into senility. manacles of caste which prevail in that em-pire are as cruel and unyielding as those which chain the sudras in Hindostan to an hereditary state of pauperism and slaver As an acute thinker has sagaciously o As an acute thinker has segmented invian served, the Chinese seem to be antediluvian men renewed. Their code of morals, their forms of worship and their maxims of life are those of the remotest antiquity. In this report, that government is opposed to the aspect, they stand a barrier against which emigration of its people, and in our judgment, founded upon reliable evidence, would tion exerts itself in vain. And in an ethno logical point of view, there can be no hope that any contact with our people, however long continued, will ever conform them to our institutions, enable them to comprehend or appreciate our form of government, or to ne the duties or discharge the function

of citizens.

During their entire settlement in California they have never adapted themselves to our habits, modes of dress or our educational system. They have never learned the sanc tity of an oath, never desired to become citiens or to perform the duties of citizenship, ever discovered the difference between right and wrong, never ceased the worship of their idol gods or advanced a step beyond the musty traditions of their native hive. Impregnable to all the influences of our Anglo Saxon life, they remain the same stolid Asiatics that have floated on the rivers and slaved in the fields of China for thirty enturies of time

In view of all this, we inquire what are the benefits conferred upon us by this isolated and degraded class? The only one ever sug-gested was "cheap labor." But if cheap labor means white famine, it is a fearful benefit. If cheap labor means not only starvation to our own laborers, but a gradual yet certain depletion of the resources of our State for the enriching of a semi-civilized foreign country, it is a benefit hitherto unknown to the science of political economy. If cheap labor means servile labor, it is a burlesque on the policy of emancipation.

And if this kind of cheap labor brings in its
train the demoralization consequent upon the enforced idleness of our own race, the moral degradation attendant upon the presence in our midst of the most disgusting licentiousness, and the absolute certainty of pestilence arising from the crowded condition and filthy habits of life of those who perform this so-called cheap labor, it were well for all of us that it should be abolished.

We thus find one-sixth of our entire population composed of Chinese coolies, not involuntary but by the unalterable structure of their intelligent being voluntary slaves. This alien mass, constantly increasing by immigration, is injected into a republic of freemen, eating of its substance, expelling free white labor, and contributing nothing to the support of the government. All of the physical conditions of California are in the highest degree favorable to their influx. climate is essentially Asiatic in all its aspects, and the Federal government, by its legislation and treaties, fosters and promotes the immigration. What is to be the result? Does it require any prophetic power to fore-tell? Can American statesmen project their vision forward for a quarter of a century and convince themselves this problem will work out for itself a wise solution? In that brief period, with the same ratio of increase, this fair State will contain a Chinese population outnumbering its freemen. White labor will ence upon the wages para we condition nevertheless becomes that of an abject slave, for grinding poverty is absolute be unknown, because unconstance. The vaunted "dignity of labor" how long a period will elapse before California will, nay must, become essentially a State with but two orders of society—the master and the serf—a lesser Asia, with all its deathly lethargy?

their their See a more dire result! Is it not possible that white labor, unable to compete with order for thousands of years, serfs. They that white labor, unable to compete with never rise above that condition in their native land, and by the inexorable decrees dition becoming slowly but inevitably more of caste, never can rise. Servile labor to them is their natural and inevitable lot. Hewers of wood and drawers of water they have been since they had a country, and servile laborers they will be to the end of yet yield no tribute to the State. This is a frightful possibility, but we have within a brief period witnessed its portents, and, had it not been for the untiring vigilance of the conservative portion of our people, we might have seen not only the Chinese quarters but our cities entirely in ashes and families homeless, and the prosperity and good fame of California shattered and disgraced.

It is no answer that these uprisings are the work of the criminal classes only; they have a deep root in the sense of self-preser vation. Throughout the length and breadth of California the white laborer knows th effect of this grinding competition. He reads it not in books, nor in the press; he learns it from no lips; he feels it in the empty pocket, the hopeless search for work and the gaunt want that sits at his hearth.

The duty devolves upon us to suggest a remedy for the suppression of this immigra-

The Chinese now here are protected by our treaty obligations and laws, and that the children would thus be brought beneath they will continue to receive that protection the benign influence of Christianity, cannot the people and government of this State will be responsible. If further immigration is a hundred prevented they will gradually return to their own country, and the occupations in which they are now engaged will be supplied with Neither is there any possibility that in the future education, religion or the other such that the employment of Chinese will be,

as it has to a considerable extent been dis

port of Hong Kong, a British colony. No alteration in our treaty stipulations with China could have the slightest effect upon

the passenger trade of that port.

The British colonies of Australia have, like us, suffered under the incubus, and have recently endeavored by hostile legislation, and in some instances by force, to effect the exclusion and obstruct the further ingre Chinese. Those agitations, coupled with the earnest and uniform policy of Great Britain Chinese of suppressing any traffic resembling the slave trade, convince us that an appeal to that country would lead to the desired result. The iron that em-that em-as those reasons addressing themselves peculiarly to Her Majesty's government, it would upon roper diplomatic representations cordially poperate with our own government in own government in arriving at a satisfactory remedy

With the Chinese government there need be no difficulty. As will appear by the readily consent to a modification of existing treaties; and for this reason, also, such modification would not necessarily disturb, in any manner, our commercial relations

with China.

We would, therefore, most respectfully suggest as the means of a final solution of this grave and ever-increasing difficuly, first, an appeal to the government of Great Britain to co-operate with our own government in the absolute prohibition of this trade in men

and women; and second, the joint and friendly action of the two countries with the Empire of China in the abrogation of all treaties between the three nations permitting emigration of Chinese to the United States And in the meantime we earnestly recom mend legislation by Congress limiting the number of Chinese allowed to be landed from

any ressel entering the ports of the United States to, say, not more than ten. This policy would in a great degree tend to a redress of the grievances that now so sorely afflict our State and threaten to over-

shadow her prosperity.

And your memorialists will ever pray, etc. Adopted at a meeting of the committee held in the city of San Francisco, August 13th, 1877.

The committee with this memorial will transmit to Congress an elaborate ar, ument, supported by selections from the testimony of reliable witnesses. The argument will shortly be printed for circulation.

Splicing Iron and Steel W re.

The Coal Trade Journal gives the following account of a new method of splicing iron and steel wire:

In manufacturing guides for coal and other pits, colliery ropes, telegraph wire, telegraph cables and fencing, and in other manufactures it is often necessary, in order to obtain wires of the required length, to join two or more lengths of wire together, end to end, and this is ordinarily done by the process of welding. But in welding together wire of iron or steel the metal is frequently so injured during the welding process that the junction formed is very weak, and the wire is liable to break at the welded part. The object of an invention of Mr. W. Hibell, of Birmingham, England, is to produce wires of iron and steel of any required length, having at the joined part a strength equal to any other part. He cuts away a portion of the end of each wire, so as to give it a semi-cylindrical figure, the cutaway portion extending about I inch from the end of the wire. The extreme ends of the wires may terminate in planes at right angles to the axis of the wire, but he prefers to incline each end so as to give it a wedge shape, the thin end of the wedge terminating in the axis of the wire. When he thus inclines the ends of the wire, he makes the shoulders terminating the cutaway parts of an undercut figure, so that the wedge-shaped end of one wire, when the ends of the two wires are fitted together, shall engage with the undercut shoulder of the other wire. The ends of the wires thus shaped he connects together by the process of brazing or hard soldering, and the junction formed or hard soldering, and the junction formed has a strength equal to that of any other portion of the wire. In wires of small diameter he prefers to give to the ends to be joined a plane, making but a small angle with the plane in which the axis of the wire is situated. The two plane inclined ends are joined by hard soldering or brazing. In practice he has found that planes of about one nch in length formed on the wires answer

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The address of Prof. E. C. Pickering, as Vice-President of the American Association. and President of Section A (mathematics and physics), was read by proxy, as he did not attend the Nashville meeting. The address was an argument in favor of the endowment of scientific research. Its most interesting portion was the description of a suitable building and arrangements for a physical laboratory where experiments might be made to carry out scientific researches. Prof. Pickering gave elaborate details of his pro-ject, and pointed out the numerous advan-tages that might be expected to result when these facilities were afforded to investigators.

The plan includes the appointment of a presiding officer and a staff of assistants. The siding officer and a staff of assistants. The
"castle in Spain" of Prof. Pickering is not
a thing of beauty. He says: "The building
itself is large but low, and resembles one or
more blocks of two story dwelling houses.
No more common mistake is made than in
wasting the money which should be used for
commonst on architectural effect. It is useequipment on architectural effect. It is use less to hope for architectural beauty in this

The Paris Exposition of 1878.

A correspondent of the Manchester (Eng.) Examiner writes as follows of the coming French Exhibition, from which, owing to the inexensable apathy of our government, American exhibitors are likely to be ex-

cluded:
During the last three months which have elapsed since the coup d'etat of the 16th of May, the Parisian public, especially that portion of it engaged in commercial pursuits, have been considering with some anxiety what effect present or future political complications are likely to have on the fate of the great Exhibition, which, it is hoped, is to draw all the world to Paris in the spring of next year. The anxiety is not unfounded. the great Exhibition, which, it is hoped, is to draw all the world to Paris in the spring of next year. The anxiety is not unfounded. Every day it becomes more apparent that the course pursued by the government has inflicted a blow on French trade from which it is not likely to recover, at least till after the elections; possibly not then. As it is also certain that the Exhibition will have to depend chiefly on France and England for its success, since neither Germany, Russia, Turkey, nor Greece will, so far as their intentions are yet known, take any part in it, the continuance of the present abnormal depression in France must necessarily deprive the undertaking of a great deal of the support it would otherwise receive in the country. There are, indeed, not wanting prophets, both in the press and in political circles, who plainly assert their convictions, not only that the Exhibition will not take place at all, but that the government has not only that the Exhibition will not take place at all, but that the government has already such a contingency in view, notwithstanding the sanguine official report just issued. This belief, it should however be said, is chiefly current among those who fear that whatever may be the result of the October elections the government will not recede from the position it has taken up, and that a foreign war is a very possible outcome of their policy. The question of course need not here be discussed, though one circumstance may be mentioned which one circumstance may be mentioned which in some degree seems to corroborate the idea. in some degree seems to corroborate the idea. Whatever may be the reason, it is clear that slow progress is being made with the colossal works in the Champ de Mars and the Trocadero. As the Exhibition is to open in May next, the chief part of the building ought certainly to be completed at least a month or six weeks beforehand, so as to allow time for the arrangement of the articles to be exhibited. But at the present time it appears as if the work could not be nearly finished within the date assigned for its completion. Speaking broadly, it for its completion. Speaking broadly, it may be said that at least 7000 or 8000 work-men would be required to get the buildings and gardens ready in time, while it is doubt-ful whether there are at present more than a third of that number engaged, and immense a third of that number engaged, and immense quantities of stone and other material are lying idle for want of hands to deal with it. The matter may be one of no ultimate moment, for it is quite possible that a sufficient number of workmen may yet be put on; but as the winter is by no means a favorable season for building operations in Paris, the apparent loss of time and opportunities. Paris, the apparent loss of time and oppor-

tunity in the summer naturally excites suspicion in the minds of those predisposed to take a gloomy view of the matter.

Nevertheless, backward as the works are compared with the time still at disposal, they are so far advanced as to give a very clear idea of what their appearance will be when finished. The whole scheme projected by MM. Davioud and Bourdais, the architects, is one of unexampled magnificence even in this city of palaces, and in the minds of most visitors the Exhibition buildings will probably excite as much interest, and even astonishment, as the Exhibition itself. The first and most important position is that of the Palais du Trocadero, which stands on the high ground from which it takes its name, and overlooks a great part of Paris. The palace is built of white stone, and forms an immense crescent, sweeping down toward the Champ de Mars, the total length from the great pavilion at either extremity being nearly 450 yards. The two arms of this crescent are united in the middle by a rotunda of gigantic proportions, the dome of which is to be surmounted by a colossal gilt figure of an archangel, and from the junction of the ends of the crescent with this cathedral-like building spring two square towers, each over 100 feet high, and both resembling somewhat the minarets of an Oriental mosque. From each of these towers electric lights will flash over Paris at wers electric lights will flash over Paris at glut. The chief entrance to the palace will at the back, in the Trocadero, but this le of the building is quite plain compared that which overlooks the Champ de Mars. Passing through this cutrance we come into the hall of the rotunda, the size of which may be judged from the fact that it is to hold more than 10,000 persons on the occasions of concerts, prize distributions, etc., which are to be held there. Through this hall we reach the outside facade of the rotunda, which forms a noble areade con-tinued along both arms of the crescent, and forming a splendid promenade. Standing in the middle of this areade we have imme-diately beneath us the cascade, which is to be one of the marvels of the Exhibition. Issuing from a great cavern in the base of the building, this cascade will have a fall of nearly on feet over a series of steps extending its entire length of no less than 215 vards, and as it has also a breadth of about to yards it may easily be imagined how great will be the volume of water poured over the slope. At the bottom the water will fall into an enermous basin, which will serve as a reservoir for the whole of the water required in the other parts of the Exhibition grounds. From our point of vantage we also command a view of the gardens of the palace, sloping downward, the eminence on which the palace stands being nearly 80 feet above the river bank. A finer panorama than that presented cannot easily be con-ceived. Immediately beneath us, on the other side of the river, is the Palace of the Champ de Mars, which we shall describe presently. Further away we see some of the chief public buildings of Paris—the glit-tering dome of the Invalides, the Place de la Concorde, the Louvre, and the ruins of th Tuileries, and further away still the Height of Montmartre, the Buttes Chaumont, an

so beyond the fortifications for a distance

AMERICAN SCREW

Manufacturers of

IMPROVED Gimlet Pointed Wood Screws, Patented

1876.



After forty years' experience we offer to the trade our **Centennial Screw**, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the **improved** article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manifa colored **boxes** with new label covering end of box, and **enlarged figures** showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.

Section at Line A H Section at Line & I Section at Line C. D. Section at Line E F

The above drawings show the progress of screw making from the old blunt

point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally

concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated above. See sections at lines.

CLAIM.

"A Pointed Wood Screw naving the outer periphery of the thread upon us body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

is or 20 miles round the horizon. One car understand why the first Napoleon should have fixed on this height for the site of the building which was to have been one of the most enduring monuments of his Empire—the Palais du Roi de Rome. The project which he could not realize is being accomplished by the great-grandsons of that generation. Only the Palais du Roi de Rome would have represented the triumphs of war, and the Palais du Trocadero symbolizes the

victories of peace.

It is not easy to characterize in precise terms the architectural style of this magnificent structure, of which we have described the salient details. It is in fact half Moorish, half Grecian, combining some of Moorish, half Grecian, combining some of the most graceful features of both. Light, airy, elegant, and yet massive in proportion to its size, the design of MM. Davioud and Bourdais will give to future generations no mean idea of the architectural tastes of the France of the nineteenth century. This part of the Exhibition buildings is, as we need hardly repeat, intended to be permanent, though to what purpose it may be turned hereafter time only can decide. During the Exhibition it will be used in the first place as the head-quarters of the commission, and also for musical festivals, conferences, and reunions, as well as agricultural, horticulreunions, as well as agricultural, horticul-tural, maritime, sanitary, and other similar exhibitions; the four smaller pavilions which divide the two sides of the semicircle being intended in part for art galleries, though the chief portion of the artistic exhibition will be on the other side of the

Leaving the Trocadero, and crossing the

Leaving the Trocadero, and crossing the Pont d'Iena, we pass into the Champ de Mars, where the chief portion of the Exhibition will be held. It was at first intended to make a covered gallery over the Seine, thus practically uniting the two grounds. This design has, however, been abandoned, and visitors will pass from one to the other by the Pont d'Iena, which is to be temporarily widewed to accompadate the traffic. The by the Pont d'Iena, which is to be temporarily widened to accommodate the traffic. The Palace of the Champs de Mars is naturally very different from the other, for it is only intended to serve a particular purpose, and will be demolished as soon as the Exhibition is over. M. Hardy, the architect, has constructed his plans pretty much on the same principle as those of the Exhibition of 1867. The palace, which, with its gardens occuries The palace, which, with its gardens, occupies the whole of the Champ de Mars, forms an immense parallelogram, 760 yards in length and 360 in breadth. Each side of this paral-lelogram is a gallery, the four corners being lelogram is a gallery, the four corners being formed by large pavilions. Seven aisles, six of which run the whole length of the building, occupy the ground thus inclosed. The seventh, or rather the center aisle, is cut in two in the middle, so as to allow space for a large ornamental open square, and in addition two aisles traverse the whole breadth of the inclosure, these again being subdivided by large ornamental arches, which form two by large ornamental arches, which form two sides of the open square. The center aisle of which we have spoken is joined to the others, above and below the square, by smaller passages or galleries. The front entrance of the Palace is in the Quai d'Orsay facing the Trescalere, the Avenue de la Rourfacing the Trocadero, the Avenue de la Bourdonnaye forming the left side, the Avenue de Suffrens the right, and the back abutting on the Avenue de la Motte Piquet, opposite the Ecole Militaire. This is the portion of the works which is in the least forward state, and though the avertion of a realities of iron. the works which is in the least forward state, and though the erection of an edifice of iron, glass and wood, of which the palace is being built, does not take so much time as one of stone, still the amount of labor yet required is enormous, and the staff of men at work seems ridiculously inadequate to cope with it. The building is to be devoted to objects of art, industry and science, everything being so arranged that the visitor will be able to study the whole of the productions of each particular country separwill be able to study the whole of the productions of each particular country separately, and passing from one to the other easily compare their respective progress either in the arts of peace or of war. The facades at the entrance to each section will be built in the style of architecture peculiar to the country to which the section is devoted, so that from an architectural point of view the visitor will be able to make the tour of the world not only in eighty days but eighty minworld not only in eighty days but eighty min-utes. French architecture will be shown more in detail, embracing all styles from the Gallo-Roman down to the present day. Further detail is at present unnecessary. Suffice it to say that nothing that may be considered as representative of any country exhibiting, either in an artistic, social or industrial sense, has been left out of the elaborate scheme prepared by the commis-

What the success of the Exhibition is likely to be, apart from the considerations encement, may be gathered from the fact that no less than 35,500 applications for space have been received from France alone, while in 1867 the total number of exhibitors was only 19,000. Most of these applications it is true were sent in before the 16th of May, and circumstances will not improbably necessitate great many withdrawals. The fact, how ever, indicates the interest taken by the French people in the undertaking, and will explain the prevalent anxiety about its possible untoward fate. England will also occupy a very prominent position, the names of 2000 English exhibitors having already been received, and neither Italy nor Belgium are backward, so that if the Exhibition is once opened there is no chance of its failure from want of attraction. In conclusion, we may mention that the commission has decided that the jury for awarding medals and prizes shall consist of 650 members, among whom so will be Frenchmen and the rest foreigners, the first being appointed by the Minis-terial Commissions, and the foreign jury by the government of each country represented.

The sum which has been allotted for prizes is 1,500,000 francs, and the medals will be appropriated in the following manner: 17 for fine arts, 100 chief prizes and supplementary medals for the departments of industry and agriculture together with 1000. industry and agriculture, together with 1000 gold medals, 4000 silver, 8000 bronze, and an equal number of "honorable mentions."

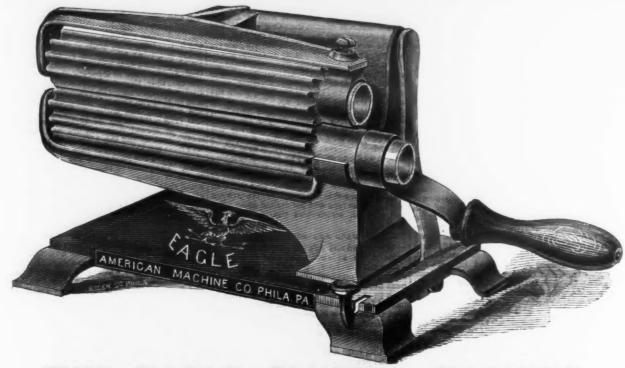
Brinly, Miles & Hardy, plowmakers, Louis ville, Ky., have completed their two new brick warehouses, 55x142, two stories, and 42x100, one story, respectively. They are running full force now.

THE AMERICAN MACHINE COMPANY,

PHILADELPHIA, PA.,

Manufacturers of

FLUTING MACHINES AND SIMILAR SPECIALTIES.



THE EAGLE FLUTING MACHINE.

To meet the popular demand of a Fluter that combines the great practical advantages of a machine having corrugated Rolls with the cheapness of the Hand Fluter, we offered the "Eagle Fluting Machine" to the trade some three months ago, feeling convinced that it would fully meet this want, and are now free to confess that our expectations have been more than realized. The machine has smaller rolls and is lighter than the "Crown" (hence its lower price), but it will do quite as good work, and for moderate use prove equally as serviceable. Sizes (length of Rolls), 3½ inches, \$18 per dozen; 5½ inches, \$24 per dozen; 618 per dozen 15 or No. 18 Rolls. Each Machine inclosed in a box, and supplied with a Clamp, four wrought iron heaters and a holder. Put up in packages of half a dozen.



The Crown Fluting Machine.

inent features of practical advantages and superior finish which have made it the leading Machine

Sizes (length of Rolls), 43/2 inches, \$2.35 each; 6 inches, \$2.75 each; 8 inches, \$4.00 each. The Roll can be had with either 10, 12, 15, 18, 22, 26 or 30 flutes. Each machine packed in a

Practical Iron Founding.

BY EDWARD KIRK I.

The foundryman cares little or nothing for a chemical analysis of iron, which merely shows the exact amount of different impurities it may contain; but the question that the foundryman asks is: What irons can I work, and how can I mix them so as to produce a good, clean, strong and cheap casting This is a question that is almost impossible to answer, as it is impossible to give a complete vocabulary of all the impurities which iron may contain, with their effect upon the iron in different proportions, as these proportions may be varied in remelting and produce different results; and even if it were possible, the foundryman does not wish to go to the trouble of making a chemical analysis of every lot of iron he gets in to ascertain its impurities and to keep track of how it may be mixed with some other lot of iron. Little can be told by looking at an iron in the pig, whether it will run hard or soft when remelted and run into castings, or whether it will mix with another brand of iron. The foundryman or an expert may by actual tests become acquainted with all the iron and ores used in a certain locality, and by looking at the iron in the pig tell very nearly what it will do when run into castings; but the best expert in the country can tell little or nothing about an iron that he has not been accustomed to working, and he will often be deceived in those he has been accustomed to by merely looking at the iron in the pig. True, he may make a good guess, and he may tell whether an iron will run extremely hard or soft, but that is all that can be told by the looks of an

iron in the pig.

It is impossible to qualify the various kinds of pig iron brought into the market by local terms and marks. It would not, after all, be of any use, because the furnacemen may be of any use, because the furnacemen may change their ores or their mode of charging the stock, and change the product of the fur-nace from a No. 1 iron to No. 2, or even No. 3 iron, which makes a great difference in its application in foundries; or a furnace may inge the quality of its iron without any the ores, and without any apparent cause for the change in the quality of iron. When operating at Lewisburg, Pa., last spring, I found a lot of pig iron that was made at the Dry Valley Furnace, Pa. This when remelted and run into a cylinder that was nearly 2 inches thick, was so hard that it could not be drilled, yet the iron in the pig was of a dark gray color, with a large open crystal, and to all appearance was a No. I soft foundry iron. This iron was made from the same ores that the furnace had been using for years. In making a No. I foundry iron, no change had been made in the mode of stocking the furnace, and there was no apparent cause for the change in the quality of the iron. This furnace, after it had been in blast for a short time, got to working so badly that it became ne to blow it out. It was then found that when putting the furnace in blast it had scaffold side, which was the cause of the hard If a blast furnace, with the fire only on one side of it, will change the nature of iron as this furnace did, then a cupola, with the fire or the blast all on one side of it will change the nature of iron when remelted. I have seen two cupolas melting the same iron, and one produced good soft, strong castings, and the other produced hard or brittle castings. I have always found that the cupola that produced the hard or brittle castings either had the blast all on one side of it. that the fire was not burnt up evenly, and that the stock was not charged regularly

Cast irons admit of a division into three classes and seven grades. The three classes are: The red-short, the cold-short and the are: The red-short, the cold-short and the neutral iron. The seven grades are the seven qualities or seven numbers of iron, as No. 1, No. 2 or No. 3, Red-short iron is an iron that has no strength when red hot, and has a great deal of shrinkage. An extreme red-short iron will shrink as high as one-fourth of an inch to the foot. Red-short iron, when used for casting pine on their end, will cause of an inch to the foot. Red-short iron, when used for casting pipe on their end, will cause the body of the pipe to shrink down and leave the bowl of the pipe before the iron has thoroughly set, and when used in other castings, such as grate bars, it will tear off and form cracks in the corners while hot. It will cause chill cracks on the tread of a car wheel, but they are not deep and do not injure the wheel. Red-short iron may be either hard or soft, and is liable to go to extremes either way. It never breaks from shrinkage when cold.

shrinkage when cold.
Cold-short iron is an iron that has no strength when cold, and has very little shrinkage. It will resist very little strain, shrinkage. It will resist very little strain, hard iron. proportion the casting will break from shrinkage after it is cold. It will cause stove proportion plates to crack under the sprews. Cold-short iron may be either hard or soft, and is liable to go to extremes either way, but it never breaks from shrinkage when hot.

Neutral iron is an iron between the ex-treme red-short and cold-short irons. It is made by mixing the red and cold-short irons together. A neutral iron is the best iron for foundry purposes, and furnacemen who make a business of manufacturing foundry iron make it a point to mix their ores so as to make as near a neutral iron as possible Yet in some localities one ore may be cheaper than another, and it may be used to excess, which may make an iron inclined to be either red-short or cold-short, yet not extreme either way. The foundryman that is using three different brands of iron may find at times that he has two brands of iron inclined to be cold-short and one brand inclined to be red-short. If these three irons are mixed in equal proportions they will make a casting inclined to be extreme cold-short. Yet one-fourth of the two brands and one-half of the brand mixed together may make a neutral iron and a good strong casting : or by leaving out one of the brands, and u one-half of each of the other two brands, th same results may be attained. The only ractical way to ascertain whether an iron s either red-short or cold-short is by actual tests in mixing and melting the iron in different proportions and testing the strength and shrinkage. A neutral iron should not shrink more than one-eighth of an inch to

the foot. Stove foundrymen should be care ful to use as near a neutral iron as possible and to change their brands of iron as little as possible, as the changes of iron often change the shrinkage, and will make trouble in mounting the stoves when much odd plate is kept on hand. When new brands of iron are introduced test bars should be made to ascer tain the shrinkage, and the different brand of iron should be varied so as to keep the

shrinkage as near alike as possible.

The same theory may be followed in ing irons to make a soft iron, thus: Three brands of iron, mixed in equal proportions may make a hard iron, while any two of the same brands, mixed in equal proportions may make a soft iron. Tests were made last fall at Perry & Co.'s stove works in melting the three brands of iron, viz., Crane, Hud-son and Jagger. These three irons were melted at the rate of 15 per cent. of Hudson to 85 per cent. of Crane and Jagger together. This mixture made a hard iron. One-third of each brand was then melted together and made a hard iron. One-half Hudson to one fourth Crane and one-fourth Jagger wer then tried, and the result was a hard iron The Hudson and Crane were then tried together—one-half each—and made a good ron. The Hudson and Jagger tried together—one-half each soft iron. made a good soft iron. The Crane and Jag ger were then tried together—one-half each
—and made a hard iron. Thus the Hudson
would neutralize either the Crane or Jagger separately, but would not neutralize them when put together in any proportion.

Iron will combine with almost all of the

64 known elements, and these elements combined with irons in different proportions will destroy the affinity of one brand of iron for another, and foundrymen, in mixing their iron, will generally use equal proportions of all the brands of iron that they are using; thus one-half, one-third or one-fourt of each brand. If the castings come hard, they will reduce the No. 2 and increase the No. 1 iron, and I have often seen foundries that were using all No. I iron that were still troubled with hard iron. This was because they were using irons that had no affinity for each other, and would not unite so as to form a homogeneous iron; and throwing out the No. 2 iron gives only a temporary relief by the excess of carbon in No. 1 iron overcoming the non-affinity of the irons; and if the No. 1 iron happened to be a little poorer one day than an other the iron was hard and uneven. I have often seen foundrymen that had one brand of iron in their yard that they had had on hand for years and could not use it, and perhaps the ext foundryman that I would meet vould be using that same brand of iron and could not get along without it. This was because the one foundryman was using other irons as a mix that had an affinity for that particular brand of iron, or the two foundry men might be using the same iron as a mix and mixing them in different proportions, which produced different results. Two poor irons can often be mixed together so as to make a good iron, as is the case in mixing the extreme red-short and cold-short irons, which forms a neutral iron that is superior to either the red-short or cold-short irons for foundry purposes. In mixing irons I should recommend mixing them and varying the recommend mixing them and varying the mixture by the local brands or marks, and not by the numbers of the iron. To make a good iron at least one-third of No. 2 should be used, and if all No. 2 irons can be used and make a soft iron, they will make a superior casting to all No. 1 iron. In melting iron Leady to the company of the compan perior casting to all No. I iron. In melting iron, I should recommend melting it hot and as fast as possible. A quantity of molten iron should be kept in the cupola or in a large ladle, so as to give the different brands of iron a chance to mix. In most all the foundries at Wheeling, W. Va., the cupolas are never stopped in from the time the blast is put on until the bottom is dropped. A large ladle is set on trestles in front of the cupola in such a manner that the iron can run into it from the cupola and be poured run into it from the cupola and be poured out into the smaller ladles at the same time. The iron is all run out of the cupola as fast as it is melted and is mixed in the large ladle. I think this is a good way of mixing irons.

HARD IRON

Most every foundryman is troubled more or less with hard iron, especially if he is manufacturing light castings. Hard iron is manufacturing light castings. Hard iron is sometimes caused by using a poor quality of iron in the first place, or poor fuel, or by using too much short iron or rusty scrap. The dampness in the sand bottom will cause the first iron to be hard. Iron boiling in a green ladle will be hard if run into light plates. Sand worked too wet, or ramped green ladle will be hard if run into light plates. Sand worked too wet, or rammed too hard, or sponged too much, will cause hard iron. Thus hard iron may be traced to a great many causes, but the principal cause of hard iron when good stock is used is the unscientific way in which cupolas are con-structed and charged. It is a well-known fact that Nos. 1, 2 and 3 irons are made in a blast furnace from the same stock, the differ-ent grades of iron being caused by the different temperatures at which the ores are melted. If a large cupola is constructed with only one tuyere the blast cannot be forced into it so as to give an even temperature, or if the tuyeres are not placed at equal dis-tances apart, or if they are so placed that one or two of them will take nearly all the blast and the balance of the tuyeres get little or none at all (as is often the case), the result will be an uneven temperature in the cupola and an iron hard and soft in spots. Cupolas are often charged with large coal in the bed. which forms large crevices between the lumps, through which the cold blast penetrates to the center of the cupola and strikes the hot iron as it drops through the coal and chills and hardens it. The bed is often put in without any regard to whether it is l or not on top when the iron is charged. The first charge of iron is thrown in and the second charge of coal in the same haphazard If the cupola is large and many gates or sprews are used, they will probably all be found in a pile on the side of the cupola, where it is handy to throw them from where the man stands that shovels them in. The iron will invariably be higher just under the charging door than anywhere else. The coal or coke is thrown in, and, if small, will roll to the lowest place; thus having a large body of fuel in one place and little or

ing makes an uneven temperature, and a hard and soft iron; or the iron may be charged even, and each charge leveled up, and the coal put in on it in large lumps (as is often the case), so that the small amount was asset of 25 per cent. I do not think any-also at intermediate points. Thus it will be used will not more than half cover the iron. and will not separate the charges of iron properly. The result is the same as when the charges of iron are not leveled up-an uneven temperature, and hard and uneven iron. I have seen two stove plate foundries, in the same city, not more than two squares apart, melting the same brands of iron mixed in the same proportions, each using the same quality and same percentage of coal; and one foundry always had good soft coal; and one foundry always had good soft iron, and the other one was always troubled with the iron running hard in spots. On examining the cupola, where the hard iron was made, I found it to be a round cupola was made, I found it to be a round cupola late 4 feet 6 inches in diameter, with a stack 5 feet or more in diameter. This cupola had five tuyeres; one was directly in front, and in line with the supply pipe; the others were scattered around at irregular distances apart. The tuyere in front of the supply pipe was admitting almost as much blast into the cupola as all the other four tuyeres put together, especially toward the last of the heat, when the tuyeres became clogged up. The iron was put into the cupola in charges of 4400 lbs., and the coal in charges of 350 lbs. The and the coal in charges of 350 lbs. The coal was put in in large lumps, and was not and the coal in charges of 350 lbs. The coal was put in in large lumps, and was not near enough to cover the iron, or separate the charges of iron properly. The stack of this cupola was too large to concentrate and the effect of the heat upon the iron could be equalize the heat, the tuveres were not arranged so as to give an equal amount of blast to all parts of the stock, and the coal was not charged even enough to give an even heat, and the iron was not melted at an even temperature, which was the cause of the iron was converted into the black oxide of hard spots.

HARD AND SOFT IRON.

When hard and soft iron are melted in the same cupola, as is often the case in jobbing and small foundries, the hard iron should be melted first one heat, and soft iron first the next heat, as part of the last iron will always stick in the lining; and if the hard iron is melted last, and the soft iron first, the next heat the first few ladles will be more or less hard, from the small particles of hard iron remaining in the cupola from the former

Melting hard and soft iron in the same heat is a bad practice.

To melt iron soft and even, with an even shrinkage, it must be melted at an even temperature, and the nearer we can come to a natural draft the better for the iron. The tuyeres should be put in at equal dis tances apart, and so arranged as to admit an equal amount of blast at each tuyere. The tuyeres should be of a size to correspond with the blast pipe from the fan or blower, and th fan or blower should be run to suit the th fan or blower should be run to suit the cupola. A too sharp and cutting blast is injurious to the iron, and slow melting is equally injurious, so that we must have a mild blast and volume enough of blast to do fast melting. The stack of the cupola should be small, and high enough to give the cupola a good, even draft; the bed should be evenly lit up, but not burnt too much before the iron is charged. Small cfall or be evenly lit up, but not burnt too much before the iron is charged. Small coal or coke should be used all through the heat, and each bed of coal or coke should be properly leveled up before the iron is charged on it; so should each charge of iron be leveled up before the coal or coke is charged on it. The before the coal or coke is charged on it. The iron should be charged into the cupola from one to three hours before the blast is put on (according to the draft of the cupola), so as to have it heat up gradually and anneal. The iron should be put into the cupola in large charges, so as to give a good bed of coal or coke between the charges and separate them properly without using too much ate them properly without using too much fuel. When different brands of iron are used the cupola should never be tapped close, but a few hundred of molten iron allowed to remain in the bottom of the cupola so as to give the iron a chance to mix.

BURNT IRONS.

When in the malleable iron business, I often tried to melt the annealing boxes in a cupola, with coke, after they had been burnt out, but I never could produce more than 50 per cent. of iron, and the iron produced was so mixed with slag that it could not be used for castings without remelting. The iron produced was always white and hard. I made a test at the American Stove and Hollow-ware Company's foundry in Philadelphia, Pa., in July, 1874, in remelting annealing pots that had been used for annealing hollow-ware. These nots were about 2 inches thick, they These pots were about 2 inches thick; they were charged in the cupola in the ordinary way, Lehigh Valley coal being used as fuel. The result of this test was a product of about 70 per cent. of iron, which was so mixed with slag that it could not be run into castings; the iron was also white and hard. The larger percentage of iron produced when remelting the hollow-ware annealing pots than was produced when remelting the malleable iron annealing boxes, was cause by the hollow-ware pots being heavier and not o badly burnt, and not by the different fuels used in remelting. The best way that I have found for melting burnt iron in a cupola is to put it in the cupola with the regular charges of good iron, a little at a time; it will then act as a flux, and is better than will then act as a flux, and is better than limestone, especially if the iron is badly burnt; but care should be taken to not use too much of it at a time, as it will harden the good iron if used in too large quantities.

SHOT IRON

Every foundry has more or less shot iron or fine scrap, from the rattle barrels and gangways. This class of iron, although gangways. made from the best of pig iron, will run hard when remelted, and in some cases will not mix with other iron (especially if the shot is rusted), but will cause hard specks in ma wich in stove-plate or light castings, form ing a plate hard in the center and soft on each side. Foundrymen who run exclusively on first-class work have considerable trouble in getting rid of this class of iron, and it is often thrown out in the dump rather than remelt it. I made a test in remelting shot iron at the Baldwin Locomotive Works in Philadelphia, in June, 1874. In this test the thing was gained by putting the iron in the wooden boxes, for the boxes were all burnt up before the iron even became hot.

at a store works in Louisville, Ky., in May, 1875. In these tests the shot iron was charged on the first bed of coke, with a view of melting it first and using the iron for warming the ladles, and then pouring it into the pig bed or some heavy work. This way of melting the shot iron was a success so far as getting rid of the shot and using the iron was concerned; but it was found that the cinder and dirt, mixed with the shot iron, formed a coating of slag and dirt over the lot of shot iron that had got mixed with fine coal, and in order to separate the iron from the coal they thought they would burn the coal under their boiler and melt the shot iron, and have it run through the grate bars into the ash pit, and collect it in pigs. With this view a thin layer of fine coal seen. The result of this test was that when the iron came near the melting point the small shot threw off beautiful fiery stars of iron, so that not a particle of iron could be found either on the grate bars or in the ash observed, in making tests to ascertain the percentage of loss was always greater that the percentage of loss was always greater the percentage of loss was always greater that the percentage of loss was always greater than the percentage of loss was always grea the shot iron was charged through the heat; and from different tests that I have made in melting shot iron I have concluded that it should not be charged on the bed or in the first of the heat, because more fuel will be required to make hot iron. It should not be arged in small quantities through the heat, for it is too much exposed to the gases of the cupola, and the oxygen of the blast converts it into the black oxide of iron, and it is lost. I find that the best results are produced when the shot iron is charged in a large body as it was at the Baldwin Locomotive Works it then lies compactly together and the heat melts it before the oxygen of the blast can convert it into an oxide. I think the best convert it into an oxide. I think the best way for melting shot iron in a cupola is to charge it after all the other iron has been charged into the cupola; it then forms a cover over the iron and prevents the escape of the heat, and the loss by the wastage of iron may be made up by the saving of fuel. It also improves the quality of the shot iron to melt it at the last of the heat, when the cupola is hot. Shot iron, if melted and run into pigs, will mix with other iron when remelted.

Shot iron has been melted in iron boxes or pots with about the same results as in the wooden boxes.

Underground Telegraphy.—The Phildelphia Ledger says: "Underground adelphia Ledger says: "Undergretelegraphy was the subject of much cussion and some disputes a few months ago, when a change in the office of the Western Union Telegraph Company in this city seemed to offer a favorable opportunity to lay underground wires. For so the plan does not advance rapidly in this country, although there are lines laid under ground in many of the larger cities of Europe, and the underground system has been adopted for some long lines through the been adopted for some long lines through the interior, where expensive arrangements for the repair of broken or disarranged wires cannot be made. A line was laid underground between Berlin and Cologne as early as 1848, but proved a complete failure, owing to the presence of sulphur in the gutta-percha with which the wires were covered, and which destroyed the gutta-percha. That failure brought subtarrangen percha. That failure brought subterranea telegraphy into disrepute, and for 25 years few attempts were made to lay underground cables on a large scale. At present, how-ever, Germany has seven underground lines stween its capital and its western frontier A line between Berlin and Mayence, passing through Halle, Leipsic and Frankfort, has recently completed. The wires been twisted together and covered with hemp and iron, and the cost is about six times as great as that of the same number of overground wires would be. This line is 600 kil or about 372 miles in length, and no doubt is entertained that it will work well. A short underground line is being laid, we understand, in West Philadelphia, with the aid of all the protective devices developed by ex-perience." The *Ledger* does not seem to understand that telegraph wires laid underground are very like ordinary submarine cables, and very serious retardation takes place in them. The open-air lines are the place in them. The open-air lines are the place in them. The open-air lines are the best, and the higher they are from the ground the more satisfactory their working. lic to have the wires buried, as in the end it materially increase the cost of tele graphing. The true remedy is probably in the direction of larger poles, stronger wires, with better conducting power, and finally placing the poles further apart.

Pulverizing Minerals .- A simple apparatus, intended principally for disintegrating superphosphates, clay, earth, coal, or other minerals, has been invented by H. and E. Albert, of Biebrich-an-Rhein, and consists chiefly of a peculiarly constructed open drum and wheel. Upon an axle mounted on suitable bearings is keyed a boss having a disk at one end. To this disk are bolted, say. large body of fuel in one place and little or none in another place. This uneven charged box holding from 70 to 80 pounds; one ton is fixed a concentric ring; parallel to this imported from the East.

seen that an open drum or wheel will be formed, having arms at one side only, and mounted upon an axle to which a rapid revolving motion (say, from 300 to 500 revo-I also made some tests in melting shot iron lutions per minute) is imparted by a strap or belt passing round a pulley keyed on one end of the axle. The superphosphate or other material to be pulverized is delivered by means of a hopper into the interior of this drum or wheel, and in falling it meets with the cross-stays or rods in their rapid revolution in the reverse direction, and becomes thereby thoroughly pulverized or disintegrated. A movable hood is placed over the upper half of the drum or wheel. In a modification of this invention the hopper is placed so as to deliver the superphosphate or other material on to the outside of the wheel instead of the inside, in which case the drum or wheel may have arms on both

The Use of Salt in Working the Comstock Lode Ores.

The Virginia Enterprise gives the following account of the Eagle Salt Works, which furnish the supply of salt for the mills:

The amount of common salt used in the mills working ore from the Comstock range is from 300 to 400 tons per month, there ss used in winter than during the summer, as the tailing mills (which use a great deal of salt) are then running much lighter, owing to the difficulty experienced in drying slimes.

The salt used in our mills all comes from

of Wardsworth. It is a very pure article. It is said that it is absolutely nothing but salt, there being no foreign substance or mineral in it. Much of the salt shipped from the works is taken off the cars at mills along the Carson River, at Silver City and at Gold Hill. It is put up in strong sacks, of a size convenient for handling, and arrives here in excellent condition. The salt sells at a cent and a half per pound, or \$30 per ton by the carload. A car holds about 10 tons.

Contrary to the generally received opinion. the salt is not procured in a marsh. At the place where the salt is found there is nothing resembling a marsh. Instead there is seen a large basin or sink, the surface of which is covered with sand. This basin has no present outlet, and presents the general features of an extinct lake—a lake from which all the water has evaporated.

The source of the salt found in the basin

has been traced to a ravine, in the head of which a well has been sunk to the depth of twelve feet. Shallow as the well is it affords as much water as can be raised with a sixinch pump. Should an artesian well be sund at this point the water would no doubt rise Should an artesian well be sunk to the surface and flow from the well.

The water of the well has but a slightly brackish taste and is as colorless as though it had been distilled. Specimens of the water in bottles are to be seen at the store of J. C. Hampton & Co., in this city, Mr. Hampton Irons will vary in shrinkage. Some irons will not shrink any, and others will shrink as high as a quarter of an inch to the foot. The average shrinkage, and the shrinkage always counted on in making patterns, is one-eighth of an inch to the foot.

being the agent to the Comstock. He has specimens of the water in all stages of strength or concentration, starting with that just taken from the well and ending with that just taken from the well and ending with that just taken from the well and ending with that just taken from the well and ending with that just taken from the world and which is just on the point of becoming solid crystals of salt; indeed a specimen but one week in the vats and the bottom some crystals of salt.

From the well the water is pumped into large reservoirs, where it is allowed to stand for some time, when it is conducted to the evaporating vats. The ground on which the reservoirs and vats are situated is gently descending. Neither reservoirs nor vats are made of lumber, but are built in the earth, and of the earth and sand found on the spot

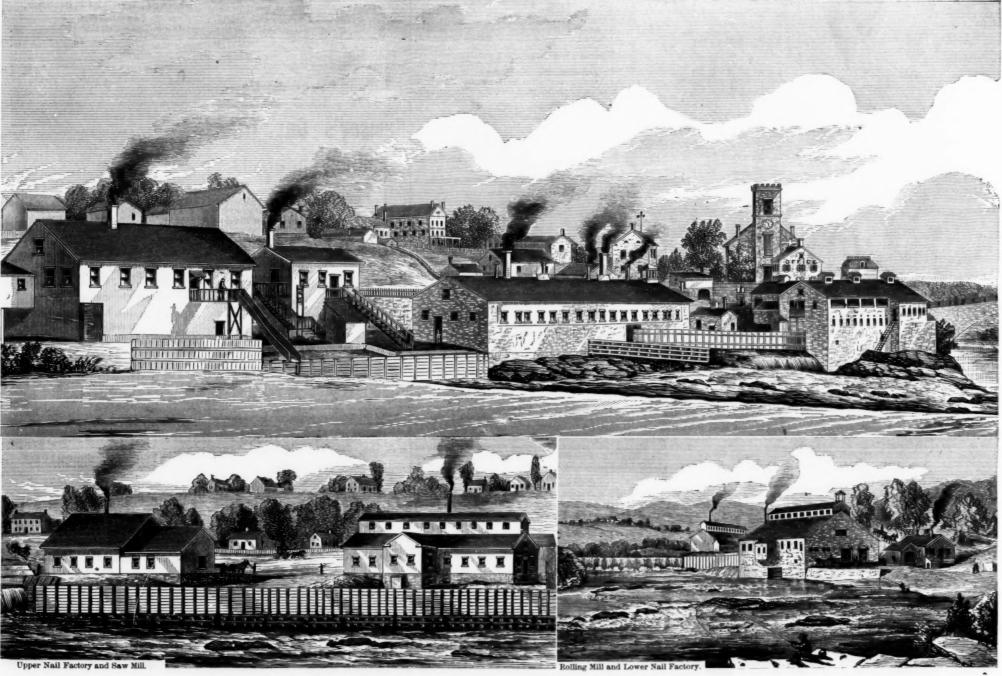
The surface of the basin is, as above stated, covered with sand. This sand averages about two feet in depth, and under it lies a stratum of tough clay. The vats are made by scraping away the sand down to the clay, and are 60 feet in width by from 200 to 300 feet in length. There being a slight inclination in the ground the water is gradually passed forward from one vat to another, growing stronger and stronger, until in the last it becomes pure salt crystals. There are ten rows or tiers of these vats, and in all they cover an area of about eight acres.

sinking a few feet in the stratum of By sinking a few feet in the stratum of clay underlying the surface sand (which seems to have blown in off the surrounding deserts) saline water similar to that obtained from the well is found. This water appears to be drawn up by the sand, when it speedily evaporates, leaving the surface coated to a considerable depth with pure white salt.

Surrounding the vats are reservoirs into which water from the well is conducted. These reservoirs are so loosely constructed that the water oozes out through their banks or walls, and, percolating the intervening sand, finally finds its way into the vats. In passing from the reservoirs to the vats the water leaches out and takes up all the salt formed in the sand and thus gains much in strength. This leaching part of the process is of great advantage in summer, when the evaporation is rapid and salt is quickly formed on the surface of the sand. The time will doubtless come when the surface sand will be shoveled into wooden vats and leached out as ashes are leached at potash works. Even in the clay, masses or pockets of crystals of pure salt are found.

The company owning the works have store-houses on the railroad. They also grind and put up an excellent article of salt for table and dairy use. Owing to the dry-ness of the atmosphere the salt put up at the Eagle Works is almost entirely free from moisture; whereas that brought from San moisture; whereas that brought from San Francisco is quite damp. Parties have sev-eral times undertaken to compete with the Nevada Works by bringing salt from Cali-fornia, but on account of the great amount of moisture the article imported contains they have failed to make it a paying busi-Doubtless, should the Nevada salt be taken to San Francisco and there stored for a time in the moist atmosphere, it would





View of the Factories of the

AUSABLE HORSE NAIL COMPANY,

MANUFACTURERS OF

HOT FORGED HORSE NAILS.

ABRAHAM BUSSING, Secretary.

OFFICE AND WAREROOMS.

35 Chambers Street, New York.

The nails manufactured by the Ausable Horse Nail Company are forged from the best Norway Nail Rods while the Iron is at a welding heat; they are hen brought to a perfect finish, ready for driving, by hammering when cold. This process gives the nails just the required stiffness, and renders them as tough as the best hand-made nails. Quality fully guaranteed. For Sale by all leading Iron and Hardware houses.

Crown Can Opener.

The American Machine Co., No. 430 Walnut street. Philadelphia. have recently added to their specialties the Crown Can Opener, which we illustrate herewith. It is a simple and very practical tool, and will open any kind of can neatly and quickly. As is shown in the cut, it has a handle with two pointed blades, each blade having two cutting edges. It is operated by piercing the lid of the can near the side, so that one blade passes down on the inside (to cut the lid), the other on the outside (acting as a guide) depressing the handle causes the edge to cut through the lid, and by raising the handle, pushing the tool forward and again depressing it the cutting is continued. The operation is very simple, and a single trial is sufficient to teach a person to handle it to handle at the upper end is looped for the con-venience of hanging it



Lever and Cam Valve.

Steam fitters and others who have to use stop valves of any size from one inch up, will be interested in the lever and cam valve which we illustrate, the invention of Messrs. Henry S. Landsell and John S. Leng. This valve, which takes up very little room, has a straight open passage the full size of the pipe. The pressure bears against the back pipe. The pressure bears against the back of the gate, tending to keep the valve tight. A quarter turn of the wheel is sufficient to



open or close the valve. The guides of the gate itself are so arranged that in opening the valve, as soon as the joint is broken and the gate leaves its seat, it is entirely free, and there is no friction between gate and seat. An indicator wheel shows the position of the gate at all times. There are very tion of the gate at all times. There are very few moving parts. Messrs. Lenig & Ogden, 212 Pearl street, New York city, are the

American Piano Castings.

In a special report on American metals and metallurgical operations as shown in the Centennial exhibits, Herr Franz Kupel-weiser, of Vienna, Professor of Metallurgy and Director of the Imperial Austrian Mining Academy, says of some American piano castings examined by him:

The iron used in the castings of Steinway's pianos shows the following composition on analysis by Professor Otto, of Brunswick,

Iron	94	.71
Carbon (graphitic)		1-34
		415
Silicon		.20
Manganese		.50
Sulphur		80.0
Total		9.98
Specific weight, 7.28. Tensile strength, 2270	k, per sq. cent.	

No trace of phosphorus was discovered nor is there any appreciable quantity of arsenic. It appears from this that Stein-way's castings contain very little carbon—

scarcely more than some steels. The .02 parts not accounted for in the analysis consisted of something which the determination did not establish, and the Steinways did not say what it was. This is under-stood to be a secret known only to the manager of their foundry at Astoria, L. I.

A New Merchant Mill.-Brown, Bon-

We are not informed whether the foundation is to be of brick or stone. In addition to this mill that will be built, Messrs. John Ellis and O. D. Jones, the contractors, are building for Brown, Bonnell & Co. a stock room on the northeast side of the Phoenix Furnace, and another on the south side. The one on the northeast side is to be 100 fact in length by 6f foct in width, the used. feet in length by 66 feet in width, to be used as a stock room for ore and limestone. The other will be 178 feet long and 66 feet wide, to be used as a stock room for coke.

Charcoal Iron Making in Kentucky.

The following proportions of the eleven charcoal furnaces of the Kentucky portion of the Hanging Rock iron region are taken from Shaler's Geological Survey:

0441				2	-		2	300	ow.A	~/6		-		
Kind of hot-blast	Diameter of steam cylinder. 1 ft. 6	Stroke of "	Diameter of "	Number of blast cylinders	Length of "	£ "	Number of boilers	Diameter of "	Number of tuyeres	Diameter of throat	Batter of "	Diameter of bosh 10 ft.	Height	
,	P	=		13	16 ft.	8 in.	13	4 in.			53 deg.	10 ft. 6 in.	34 ft.	Bellefonte.
Cold blast.	ift. 6 in. ift.	6 ft.	4 ft.	10	48 ft.	3 ft	63	4 in.	₩	2 ft. 4 in.	53 deg.	roft. 6 in.	ft. 44 ft. 7 in. 40 ft.	Boone.
Davis.	1 ft. 3 in.	5 ft.	3 ft. 1 in.	13		3 ft.	80	4 In.	040	3ft. 8 in. 2ft. 4 in. 3ft. 4 in. 3ft. 3ft. 6 in. 7ft. 6 in. 2ft. 8 in. 3ft. 3ft.	53 deg.	10 ft.		Buena Vista Buffalo. Hunnewell. Iron Hills.
Davis.	1 ft. 3 in. 1 ft. 3 in.	6 ft.	3 ft. 1 in. 3 ft. 4 in.	63	32 ft.	2 ft. 9 ln. 3 ft.	63	31/4 in.	10	3 ft.	55 deg.	10 ft. 6 in. 12 ft.	36 ft. 6 in. 47 ft.	Buffalo.
Hoop.	3 in. 1 ft. 6 in. 2 ft.	Sft.	4 ft.	10			3	43%	I	3 ft. 6 in.	53 deg.	12 ft.		Hunnewell.
Hoop.	aft.	4 ft.	5 ft. 6 in.	I	50 ft.	3 ft. 4 in.	Ç.a	in, 3½ in.	w	7 ft. 6 in.	53 deg.	12 ft. 6 in.	49 ft.	Iron Hills.
5 ft. 8 in. Hoop.	ıft. 3 in.	5 ft. 6 in.	aft. 6 in.	80	48 ft.	3 ft.	10	4 in.	¥	2 ft. 8 in.	50 deg.	6 in. 16 ft. 6 in. 10 ft. 6 in. 11 ft.	37 ft.	Kenton.
Davis.	in. 1 ft. 3 in.	4 ft.	in. 3 ft. 3 in. 3 ft.	80	37 ft.	2 ft. 9 in.	မ	4 in.	ы	3 ft.	55 deg.	roft. 6 in.	39 ft.	Laurel.
t. sft. si	ıft. 3 in.	5 ft.	3 ft. z in.	10	8 ft.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	u	4 in.						Mt. Savage.
Hoop.	3 in. 1 ft. 4 in. 1 ft.	4 ft. 6 in.	1 in. 3 ft. 8 in.	10	so ft.	3 ft. 4 in.	n	4 în.	н	2 ft. 9 in.	50 deg.	10 ft. 3 in.		Pennsyl- vania.
5 ft. Hoop.	1 ft. 3 in.	4 11.	4 ft.	12		* * * * * * * * * * * * * * * * * * * *	13	4 in.	M	9 in. 2 ft. 10 in.	53 deg.	in. roft, 6 in.	35 ft.	Raccoon.

As will be seen from the above table the general details of construction are similar, excepting in the cases of Hunnewell and Iron Hills—Hunnewell being built on a model similar to the one generally adopted, but Iron Hills being constructed on a totally different plan. The lamentable failure of the latter, (worked with a bell and hopper, which forced the gas down through a main to underneath the boilers) will at once explain itself to the eye of the experienced ironmaster, which was additionally avidenced by the fact that after

Buena Vista has been dismantled altogether

Buena Vista has been dismantled altogether, and has been replaced at a location 1½ mile east of the old site by the new Princess, stonecoal furnace, of which we will speak more fully in our next paper.

In connection with these statements it will be of interest to compare the following table showing the average consumption of bushels of charcoal to each ton of pic iron made in the of charcoal to each ton of pig iron made in the respective years, and the quantity of iron made, ending with 1874:

	Years.	Char- coal.	Years.	Iron Made
Bellefonte	5	185	5	15,761
Buena Vista	5	141	8	17,760
Buffalo	3	*229	5	7,725
Hunnewell,	- 5	161	5	17,829
Kenton	4	197	5	11,274
Laurel	4	*175	8	7,563
Mt. Savage	3	364	4	10,017
Pennsylvania	5	HQ4	5	9,513
Raccoon	X	163	5	5,666
Iron Hills	1	278	1	961
Boone			9	2,600

*Working cold blast part of the time.

A New Merchant Mill.—Brown, Bonnell & Co., of Youngstown, Ohio, are getting the material on the ground for another rolling mill. It is to be a merchant mill for the manufacture of hoop and band iron and, possibly, cotton ties. The mill is to be put up just to the south and east of the merchant department of the new mill, on the site of the old forge. Its dimensions are 180 feet long by 60 feet in width, and it will cover two trains of eight-inch rolls, with room for three high sheet rolls that will be built hereafter. Brown, Bonnell & Co. have never engaged in the manufacture of hoop iron or cotton ties, but the firm is becoming so well and favorably known throughout the country that they are being pressed for this kind of iron and are building the new mill to accommodate their customers. The new mill will give employment to from fifty to seventy-five additional men and boys. Their own carpenters are busy at work on the frame.

Bellefonte (Ky.) Furnace, under the efficient management of Charles Mead, Esq., continues in successful operation, making an average of from 12 to 13 ms of No. 13 ms of No. 15 making an average of from 12 to 13 ms of No. 15 making an average of from 12 to 13 ms of No. 15 ms of No. 15 making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms insuccessful operation, making an average of from 12 to 13 ms of No. 15 ms of No. 15 ms of No Bellefonte (Ky.) Furnace, under the effi-

Special Notices.

PUBLISHED MONTHLY BY

DAVID WILLIAMS,

No. 83 READE St., NEW YORK.

Branch Offices,

220 South Fourth St., Philadelphia 77 Fourth Ave., Pittsburgh, Pa.

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Single Copies, 50 Cents. CONTENTS.

No. 1. SEPTEMBER, 1877. Vol. 1.

Mechanical Treatment of Metals. Prof. R. H. Thurston New Iron District of Ohio......E. C. Pechin Analyses of Bessemer Steels..... Siphon Tap in Lead Smelting Danks Furnace at the Millvale Works.

John I. Williams Stopping Up of Regenerators in the Siemens Furnace Studies of Elemental Iron and its Modifications.....

Prof. Henry Wurtz Iron Making in New South Wales Chlorine Compounds in the Blast Furnace.. Protecting the Lining of Blast Furnaces..

Determination of Phosphorus in Iron,

PROSPECTUS.

It is evident to all who are well informed as to the state of the metallurgical industries of the world, that we have fairly entered upon an era of exceptionally rapid scientific progress, in which many of the old methods of treatment will be superseded by new and more economical processes The "New Metallurgy" demands a current litera ture of its own. Newspapers cannot give space to the calm discussion of matters of purely scientific interest; books can, at most, follow progress at a distance. The Metallurgical Review is intended to be a record of current progress, which shall combine the enterprise of a newspaper with the convenience and permanent value of a book. Its interest is both scientific and practical, and its conductors will spare no pains to secure valuable orig inal contributions from writers of known ability and recognized scientific standing, American and

The field of The Metallurgical Review includes whatever is new and important, or which possess historical or practical interest relating to the metal-lurgy of the useful metals, from the mining of the ores to the final processes which make the metals available as materials in the arts. Matters of scientific interest indirectly connected with these subjects will also be considered, when of importance to the student or the original investigator.

The indexing of the volumes will be very com-plete. Each will have a general index of titles and a full topical index to aid the student in searching for facts and references. It is intended that a set of volumes shall be a valuable library of metalof the experienced frommaster, which was additionally evidenced by the fact that after the change of that furnace to proportions similar to those generally used in this region, she is now doing very well, running under the name of Charlotte.

Second-Hand.

Three No. 2, Pratt & Whitney Screw Machines with wire feed.

intee No. 2, Fratt & Whitney Screw Machines, with wire feed.
One No. 3, Pratt & Whitney Screw Machine, with wire feed.
Two "Belden "Screw Machines.
One No. 3, Geared Stiles Press.
One No. 4, Geared Stiles Press.
Two Engine Lathes, 13 in. awing, 6 ft. bed.
Two Engine Lathes, 22 in. swing, 3 ft. bed.
One Engine Lathe, 76 in. swing, 36 ft. bed.
One Planer, planes 70 in. wide, 52 in. high, 27 ft.
long.

One Planer, planes 70 in. wide, 52 in. high, 27 It. long.
One Engine Lathe, 15 in. swing, 6 ft. bed; one Engine Lathe, 18 in. swing, 7 ft. bed; one Engine Lathe, 27 in. swing, 8 ft. bed; one Engine Lathe, 22 in. swing, 16 ft. bed; one 22 in. swing Upright Drill: three 4-spindle Drills: four common Milling Machine; one Brown & Sharpe Universal Milling Machine; one 36x96x0 ft. Planer; one 8 in. Shaper; one Gear Cutter; one 2-spindle Profiling Machine; one No. 1 Bliss & Williams Press; one "Bement" No. 2 Cotter and Key Seat Drill; one new "Hardaway" Bolt Heading Machine to head up to 14 inch bolts; one "Merriman" Bolt Cutter, to cut up to 14 inch bolts; one "Davy Bros." 1200 lb. Steam Hammer; one "Ferris & Miles" 2000 lb. Steam Hammer.

Steam Hammer.

Please specify which of the above tools you want and we will forward all particulars.

The above tools will be sold very low, and can be

The George Place Machinery Agency, 191 Chambers and 103 Reade Sts., N. Y.

Inventors

of articles in Builders' Hardware desiring to dispose of same by sale or on royalit, on reasonable terms, may address 140 MM (N.1 ER. Office of The Iron Age, 83 Reade St., New York.

Special Notices.

FOR SALE.

New and Second-Hand Boilers Engines, &c.

New Engines and Boilers.

15 horse Horizontal Engine, 8x12 cylinder, double crank, \$230. 15 horse Horizontal Engine, 8x12 cylinder, single crank, \$230. 20 horse Horizontal Engine, 9½x13 cylinder, single crank, \$275. 10 horse Vertical Engine, 6½x8 cylinder, \$250. 4 horse Vertical Engine, 4½x5 cylinder, \$110. 4 horse Engine and Boiler, complete, ready to run, \$240; boiler vertical tubular; tested to 150 lbs. 5 horse Engine and Boiler, complete, ready to run, \$285; boiler, vertical tubular, tested to 150 lbs. 3 horse Vertical Engine and Boiler, complete, ready to run, \$175. 8 horse Bacon Hoisting Engine and Boiler, com-plete, ready to run, \$575. 4 horse Vertical Tubular Boiler, \$125. 6 horse Vertical Tubular Boiler, \$145. Soler, \$125. • norse vertical Tubular Boiler, \$145. 8 horse Vertical Tubular Boiler, \$200. 16 horse Vertical Tubular Boiler, \$200. 16 horse Vertical Tubular Boiler, \$200. 40 horse Horizontal Tubular Boiler, \$580. One Upright Drill, swing 24 in., \$125.

Second-Hand Engines, Boilers, &c.

Second-Hand Engines, Bollers, &c.

6 horse Horizontal Engine, 16x20 cylinder, \$800, good order. 6 horse Locomotive Style Boiler, \$500, good order. 6 horse Locomotive Style Boiler, \$125, good order. 4 horse Vertical Tubular Boiler, good as new, \$100. 12 horse Horizontal Engine, 7/% x10 cylinder, pump, heater and governor, \$225, good as new. 11 horse Vertical Engine, 7x10 cylinder, \$200. 8 horse Horizontal Engine, 6x12 cylinder, \$250, good order.

We also have two new power or hand Pipe Cutting and Threading Machines, cut from ½ to 2 in, pipe, with full sets of dies, ½ to 2 nipple sockets, price \$60 each; several bench and foot lathes from \$30 to \$50.

Also Steam Pumps, Pipe, Belting, Valves, Fittings, &c., &c., &c.

Write us, stating what you want, new or second-hand, and we will answer cheerfully.

Lovegrove & Co.,

125 N. Fourth St., Philadelphia. Ramsey's Car Truck

A Practical Testimonial.

Shifting Apparatus.

Pennsylvania & New York Canal & R. R. Co.,)
Office of General Superintendent,
Sayre, Pa., August 17th, 1877.
To whom it may concern: This company has just constructed, at Eric Railway Junction, near Waverly,
N. Y., a Ramser Car Thuck Shirpins Affrantos.
The undersigned, who have examined the construction and operation of this apparatus, have no hesitation in recommending its adoption for changing cartrucks, or transferring through cars between roads of different gauge, and believe it to be the cheapers, simple the construction of the company of the construction of the constructi

Any information desired can be obtained by

RAMSEY & SCARLETT,

Box 162, Cobourg, Ontario, Canada. For Sale.

The business of the late L. B. Flanders, together with Stock, Tools, Fixtures, &c. The business is well established and the specialties are all protected by patents. There is also a good general machine business established, making it a very desirable investment for a live business man. For further particulars, address

L. B. Flanders' Estate, 1025 Hamilton St., Philadelphia.

GENTLEMAN HAVING A FOUR YEARS A experience in the agricultural implement trade on the continent, desires to make an engagement in a similar line, or in machinery or manufactures. Has a first-class acquaintance in Germany, Austria, Belgium, Holland, Sweden, France and Rus-ia. Best of references given. Address
P. O. Box 972, Auburn, N. Y.

SPECIAL NOTICE.

The undersigned offer their services as agents to American Producers of Metals. They represent foreign brands of Zine, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.

LOUIS WINDMULLER & ROELKER, 20 Reade Street, N. Y.

Notice

is hereby given that the partnership lately subsisting between the undersigned under the firm name of W. M. B. Hammond & Co. was this day dissolved by mutual consent. Either member will sign in liquidation. WINTHROP M. B. HAMMOND. Sept. 18t, 1877. WILLIAM S. MIDDLETON,

Notice is hereby given that a copartnership was this day formed by the undersigned under the firm name of W. M. B. Hammond & Co. Business will be carried on at 34 Warren Street, in the city of New York.

Sept. 18t, 1877.

WILLIAM S. MIDDLETON.

Wanted-A Partner.

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established. CAR WHEEL FOUNDRY, P. O. Box 134, Selma, Alabama,

Wanted,

A General Agent in every State in the Union, for the sale of Wrought Iron Highway Bridges, new in design, combining maximum in strength and minimum in cost. For particulars address

WM. O. DOUGLAS, Binghamton, N. Y.

Special Notices.

CHARLES OTTO.

Importer & Dealer in HARDWARE.

Manufacturers' Agent, etc. 12 & 14 Front and 250 & 252 Market St., San Francisco.

I am prepared to make arrangements with Eastern manufacturers to act as their agent for the sale of Hardware, etc., on the Pacific Coast.

REFERENCES:

Sargent & Co., 37 Chambers Street, New York. Van Wagoner & Williams, 82 Beekman St., N. Y T. Hessenbruch & Co., 10 N. 5th St., Philadelphis, The Pennsylvania Tack Works, Norristown, Pa. The Pacific Bank, San Francisco

Export to Germany And Surrounding Countries.

Agency for Soliciting Patents

In the German Empire. See the new Patent Law published in a ll in The Iron Age of June 21, 1877.

Hammacher & Delius, HAMBURG, GERMANY. Dealers in exclusively

American Hardware, Agricultural Im-plements, House-Furnishing Goods, &c. House in New York, A. HAMMACHER & CO.

Auction Notice.

BISSELL, WELLES & MILLET, Auctioneers,

Auctioneers,
will hold their next Special Sale of Hardware, Cutlery, French Tinned Ware and House-keeping
Goods, Guns, &c., on Thursday and Friday, September 27th and 28th, at their salesroom, No. 15
Murray Street. This sale will comprise large lines
of Hardware in great variety, full and complete
lines of French Tinned and Enameled Ware, a
large and desirable line of Table and Pocket Cutlery, Carvers, Shears, S. P. Forks and Knives,
This sale will be worthy the attention of the Trade.
Consignments solicited from manufacturers and
importers. These sales afford those having surplus
stock to realize the cash quickly.

WANTED.—A first-class business man famil-iar with machinery and manufacturing, capa-ble of handling large bodies of men, desires a respon-sible position. References satisfactory. Address, IRON AND STEEL,

Care of P. O. Box 813, Bridgeport, Conn.

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings in quantities to order at reasonable rates.

HERMANN BOKER & CO, Proprietors, 101 & 103 Duane St., N. Y. SCHMIDT & ELBERS

BREMEN, CERMANY.

Dealers Exclusively in American Hardware. Manufacturers who wish to have their goods in-

troduced in Germany, please correspond. Wanted,

A party to buy part or all of a Patent right (here and in Canada) of a most valuable invention, con-nected with all classes of Steam Engines—principally Locomotives-or would arrange with a party to manufacture on royalty. Address, for month,

A. ALEXANDRE, Office of The Iron Age, 220 S. 4th St., Phila., Pa.

WANTED TO PURCHASE,

Hardware Business in the West.

Address, at once, WILLIAM SHORROCK, 37 Main Street, Paterson, N. J.

Hardware Business For Sale. The old Stand, Stock and Good Will of the late E. H. Fogg. This store commands the largest wholesale and retail trade east of Portland. The best of help, and doing a prosperous business.

Address

H. H. FOGG.

Bangor, Me.

TO LET.

A Light, Handsome Office Possession Immediately. HERMANN BOKER & CO.,

161 Duane Street, N. Y. SPECIAL NOTICE.

I have three patents for Dies, Machinery and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. There is a special claim on each of the dies. All persons infringing on said patents will be held responsible to the extent of the law. Russell Jennings.

DEEP RIVER, Conn., Sept. 7, 1874.

New & Second Hand Machinery & Tools New & Second Hand Machinery & Iools
One 30 in x6 ft. Pond planer; one 21 in x6 ft.
Ferriss & Miles, do.; three 16 in x3 ft. Pratt &
Whitney, do.; one 15 in x3 ft. New Haven, do.;
twelve Pratt & Whitney milling machines; two
extra heavy milling machines; one double head,
do., Wood, Light & Co., makers; three bolt cutters,
Wm. Sellers & Co., makers; one heavy chucking
lathe; one 14 in. Putnam Shaper; one 8 in. N. Y. S.
E. Co., do.; one heavy shear, cuts 2½ in.x4 in. iron;
one 700 lb. steam hammer; one 1200 lb. do.; six
16 in.x8 ft. lathes; six 14 in.x6 ft., do.; two heavy
upright drills; two Merrill Drops, 600 and 1000 lbs.
hammers; thirty spinning lathes, 12 in. swing, 4
and 5 ft. beds. Lot small engines and other machinery.

The Bullard Machine Co., Limited,

For Sale.

The stock, lease and good will of an old established Hardware and Stove Business situated in a thrivin village in Western New York.

Address

Office of The Iron Age, 83 Reade St., N. Y.

Trade Report.

Office of The Iron Age, Wednesday Evening, Sept. 12, 1877.

During the past week the speculative activity in Wall street received a sharp check, and everything became "flat." The money market gained some increased strength, and the rate on call has been 5 @ 6 per cent. The discount rate on mercantile, paper has been 6 @ 7 per cent.

gold premium have been under 104. We give below the highest and lowest daily quo-

tations.		Highest.	Lowest.
Thursday		103%	1031/4
Friday		10358	1031/2
Saturday		1035/9	103 1/8
Monday		1033/8	10338
Tuesday	 	1031/2	10338
Wednesday	 	1033/8	1031/4

Government bonds declined a little during the week in sympathy with gold. State bonds are dull and in some respects weaker. Railroad bonds are irregular, but in the main a little lower.

The stock market was strong early in the week, but fell off after the speculative movement culminated. The coal stocks, which experienced recent benefit from the advance, lost all the advantage gained for the moment and fell below their previous average. The principal dealings for the week have been in Western Union, D. L. & W., Delaware & Hudson Canal, and Morris & Essex.

The last weekly statement of the New York banks shows a further large loss in legal-tender notes, the average being \$2,-\$26,700, and a further large gain in specie, the average being \$3,931,500. The result on the total reserve is an increase of \$1.101.-800, and on the surplus reserve an increase of \$823,950—the gain in the latter being less because of the increase in the deposit liabilities of \$1,123,400. The following is a com parison of the New York bank averages for the last two weeks:

Sept. 8. The foreign trade movements for the week

are shown in the following tables:

FOREIGN IMPORTS. For week ended Sept. 8:

1875. 1876. 1877.

Total for week. \$4,380,193 \$4,117,698 \$4,075,726

Prev. reported. 241,477,726 199,885,904 227,388,511 Since Jan. 1....\$245,857,919 \$204,003,602 \$231,464,237

Included in the imports of general merchandise were articles valued as follows:

Anvils,	Quantity.	Value. S1,062
Brass goods		1.050
Bronzes.		2,217
Chains and Anchors		2,568
Cutlery		26,440
Gas flxtures		142
Guns		5,238
Hardware		366
Iron, pig. tons		851
Iron, sheet, tons		1,567
Iron ore, tons		303
Iron, other, tons		5,581
Lead, pigs		14,608
Lead ashes, casks	60	2,560
Metal goods	107	9,831
Nails		1,597
Needles		6,006
Old metal		409
Plated ware	4	61
Per. caps	7	1,910
Saddlery		778
Steel		8,628
Silverware		303
Tin, bxs		60,062
Tin, bbls	10	741
Tin, 1,378 slabs		15,838
Wire	8	241
EXPORTS, EXCLUSIVE OF	SPECIE.	

For week ended Sept. 11:

	For the week Prev. reported.		\$4,876.524 \$81,730,099	
1	Since Jan. 1	\$177,288,970	\$186,606,623	\$195.751,821

EXPORTS OF SPECIE.	1
For week ended Sept. 8:	
Total for the week	\$294,660
Total since Jan. 1, 1877	39,833,722 62,450,072 42,171,442
Government bonds at the close wer as follows:	

Government bonds at the close were	e quoted
as follows:	-
Bid.	Asked.
U. S. Currency 6'8	1321/2
U. S. 6's 1881 registered	100%
U. S. 6's 1881 coupon1103/4	XXX
U. S. 6's 1865 new reg	105%
U. S. 6'8 1865 cou	XO53/8
U. S. 6's 1867 reg	107 %
U. S. 6'8 1867 cou	10758
U. S. 6's 1868 reg10914	10934
U. S. 6's 1868 cou109½	109%
U. S. 10-40 reg	30734
U. S. 10-40 coupon	109
U. S. 58 1881 registered10736	10758
U. S. 58 1881 coupon10738	1075
U. S. 41/28 1891 registered	105%
U. S. 41/28 1894 coupon1055/	105%
U. S. 48 1907 registered1021/2	1023/8
Following are the closing quota	tions of
active shares :	
Bid.	Asked.
A Alamatic and Decider Philosophy	

U. S. 41/8 1891 registered	105%
Following are the closing quotat	7.00
active shares:	2
Bid.	Asked.
Atlantic and Pacific Telegraph 21	22
Chicago and Northwest 34	341/8
Chicago and Northwest34 Pref62¾	62%
Chicago, Rock Island and Pacific 101	1011/4
Chicago, Bur. and Quincy 1001/2	1003/4
Col., Chic, and Ind. Cent 4	434
Clev., Col., Cin. and Ind 321/4	33
Cleveland and Pittsburgh 811/2	82
Chicago and Alton 841/2	851/2
" Pref	103
Consolidation Coal 21	25
Canton 20	24
Delaware, Lack, and Western 511/4	52
Delaware and Hudson 49	4934
Express—Adams96½	98
" American 53	531/2
" United States 47½	481/2
Wells, Parko & Co 83	84
Erie 111/2	111/4
Harlem140	1421/2
Hannibal and St. Joseph	12%
PTel 27	2734
Illinois Central 701/8	7038
Kansas Pacific	2/8
Lake Shore	641/8
	58%
	77%
Milwaukee and St. Paul 311/4	6876

	_
1	
Mariposa	11/
" Pref	2 56
New York Central	03%
New Jersey Central	16%
New Jersey Southern	36
Ohio and Mississippi	636
Pacific Mail	241/2
Panama	110
	01
Quicksilver	1814
	38 3/2
St. Louis Kansas City Northern	41/2
	2316
Toledo, Wabash and Western	11
	6916
	821/4
	0-74

MINING STOCKS.

per cent. The discount rate on mercantile aper has been 6 @ 7 per cent.

All the fluctuations during the week in the discount rate on mercantile sends us the following report of the business of the New York Mining Stock Exchange for the week ending Sept. 12:

	the week ending Sept. 12:		
		losing	
		tations.	Shares
	in C	urrency.	Sold.
	Alpha	14.00	500
	Belcher	9.37%	500
	Bertha& Edith	1.30	10.500
	Best & Belcher	21.121/2	10.300
	Bullion	10.12%	8oc
	Bobtail	23/4	200
ŀ	Caledonia	4.62 1/2	1,000
	California	32.75	
	Chollar Potosi	38.75	400
	Cleveland	6.75	1,300
,	Consolidated Imperial	1.121/2	1,300
	Consolidated Virginia	1.1272	
	Confidence		1,300
1	Crown Point	5.25	
١	Eureka	45.25	500
1	Exchequer	0.6256	
	Gould & Curry	11.00	400
	Hale & Norcross.	8.00	
	Hukill ex div		
	Julia Corsolidated	2.75	100
1	Justice	3.00	1,000
1	Kentuck	6.25	* ****
ı	Lacrosse		1,500
1	Leopard	1.871/2	4,100
1	Mexican	11.50	
1	Moose	5.62%	1,300
	Northern Belle	20.87%	300
	Ontario	21.37%	700
	Ophir	18.75	1,100
1	Overman		200
	Quicksilver	29.75	
1	Quicksilver Preferred	10.50	900
1			250
	Savage	15.12%	
ı	Seaton	9.37 1/2	****
ł	Segregated Belcher	1.00	340
1	Sierra Nevada	5.50	400
ł	Silver Hill	3.621/2	400
1	Union Consolidated	6.623/2	
1	Union Consolidated of Tenn	0.0279	
4	Yellow Jacket	15.00	300
1			
1	A dividend of \$1 per she	are has	been de-

clared on Northern Belle. Dividends of \$2

Per share are announced upon Consolidated Virginia and California.

The Moose Company, whose notice of dividend appeared in our issue of last week, own over 100 acres of mineral property on Mount Roses, Posts country Colorado. Mount Bross, Park county, Colorado. This mine has furnished all the money required for its development, as well as for purchasing contiguous properties and constructing amalgamation works worth over \$100,000.

Dullness still continues in the mining share market, with but slight improvement toward the close of the week. Moose is most active, closing at 55%, the sales amounting to over 16,000 shares. Bertha and Edith remains un-changed and is quiet, closing at \$1.30. Lacrosse sold down to 32c., 4,100 shares in all. Seaton is quoted at 75c. bid. The San Francisco press continue to urge upon mining companies the importance of establishing transfer offices for their stocks in this city.

GENERAL HARDWARE.

There is little if any difference to note in the condition of the market this week compared with last; business continues active and manufacturers and dealers generally express satisfaction in regard to the volume of trade which has been done so far, and the prospect of its continuance. Few of the buyers who have visited this city have purchased beyond what was needed for the opening of the fall season, and many of them have already duplicated their first orders. We have still to report the same unsatisfactory conditions which exist in regard to the prices of certain lines of goods. Cast and Brass Butts are conspicuously irregular, and Locks continue in the same demoralized state in which they have been since the opening of the season.

The Russell & Erwin Manufacturing Company have issued, under date of 1st instant, their discount sheet No. 6, to apply to their catalogue of General Hardware, volume 3, 1875. The changes in prices have been ady noticed in these columns in the order of their occurrence.

The demand for Nails has increased since our last writing and the recent advance is, so far as we can learn, firmly maintained. As we have previously remarked, some brands of Nails are in short supply and badly assorted, and these conditions must remain until the idle mills start up again. We continue to quote 10d. \$2.50, net, subject to a discount of 10 cents per keg for lots of 200 kegs and upward.

In Foreign Hardware we notice greater activity than has been enjoyed by this branch of the trade for many seasons. The demand for fine Cutlery is particularly good compared with late years, and in Heavy Hardware a fair amount of business is being done. The demand for Anvils, both foreign and domes-tic, is reported satisfactory, and the recent advances made on leading foreign goods are,

so far as we can learn, fully lived up to. On the first page we describe and illustrate a Patent Double Acting Spring Butt, manufactured by the Sabin Manufacturing Company, Montpelier, Vt. We print below their price list for these goods, which is subject to discount 35 per cent. to regular trade.

Price List of Sabin Manufacturing Company's Double Acting Spring Hinges. Thickness Doors.

'A to 1½ inch.

1½ to 1½ ''

1½ to 1½ ''

1½ to 1½ ''

1½ to 1½ ''

1½ to 1½ '' Price per pair. \$2,50 1% to 2% 2% to 2% 2% to 2% 2% to 2% 2% to 2% 51/2 656

The Bailey Wringing Machine Co., No. 99 Chambers street, have issued the follow-

American Meat Choppers. Family Sizes for Meats and Vegetables.

an hour. 25,00 hour from 80 to 75 lbs. 25,00 an hour. 25,00 an hour. Silver's Sausage Stuffers- Hotel Sizes, Single Geared.

No. r. Capacity 6 lbs.; weight when crated, 30 lbs.; No. 2. Capacity 9 lbs.; weight when crated 40 lbs. Butchers' Sizes. Double Geared.
No. 3, Capacity 12 lbs.; weight when crated,

No. 4, Capacity 20 lbs.; weight when crated, 75 lbs. 25.00
Family Sausage Stuffer, Lard, Fruit and Jelly Press,
No. A, Capacity 2 quarts, packed in cases of
4, 6 and 12, Japanned 2,50
No. B, Capacity 4 quarts, packed in cases of
4, 6 and 12, Japanned 4,00
With inside of Cylinder and Discussion 4,00

With inside of Cylinder and Plunger Heads En-ameled. No. AA, Capacity 2 quarts, packed in cases

of 4, 6 and 12. 4.00

No. B B, capacity 4 quarts, packed in cases of 4, 6 and 12. 5.50 The American Machine Company, No. 430 upon the market a new Can Opener, which they style the "Crown," a description and ilgross; discount, 15 per cent. The "Crown" Wringers made by this company have been reduced in price to \$54 per dozen for No. 2, formerly \$57, and \$66 for No. 3, formerly \$69. They have also added a new Wringer, No. 2½, with 12-inch rolls, 1¾ inch in diameter, which they have placed on the market at \$60 per dozen. They claim that these friction Wringers possess superior advantages over other Wringers of this class, and lay particular stress on the fact that they are self-adjusting and release automatically the pressure from springs and rolls when not in use. The frames of these Wringers are of malleable iron, galvanized. We invite the attention of the trade to their advertisement on page 17, in which they illustrate their "Crown" and Eagle" Fluting Machines, which are marvels of cheapness, even in these times of low prices. They announce reduced prices for these goods in the following circular:

Office of the American Machine Co...)

30 Walnut street,
Philadelphia, Sept. 12, 1877.

To the Trade.—Owing to the extraordinary demand during the summer for our Crown and Eagle Fluting Machines, we have been obliged to increase our manufacturing facilities, in consequence of which we are mow enabled, not only to fill promptly all orders that we may be favored with, but also to make a concession in prices of from 5 to 10 per cent. The reputation of our Fluting Machines for superiority in point of the superiority in th to 10 per cent. The reputation of our Flut-ing Machines for superiority in point of practical usefulness and finish is now so thoroughly established, and their cheapness has created so universal a demand for them that we hope to be favored with increased orders. We quote price of

 Crown Fluters
 4½
 6
 8 inch

 Each, net
 \$2.35
 2.75
 4.00

 Eagle Fluters
 3½
 5½ inch

 Per doz., less 5 per cent
 \$18.00
 24.00
 Very respectfully,
H. Albrecht, General Agent.

The manufacturers of Cordage issued, under date of 7th instant, the following revised price list, which shows a reduction of half a cent per pound on Manila Cordage. This list is subject to the usual trade discount.

Prices of Cordage Sept. 7th, 1877 Manila whate Land 13½

Tar'd Manila 15

Sisal Rope, sizes above 12 th'd and Hay

Rope 1½

Sisal Rope, 12 th'd (¾ in. diam.) 12

6 th'd and 9 th'd (¾ in. and 5-16 6 th'd and 9 th'd (¾ in. and 5-16 in. diam). 12½ "
Tar'd Sisal Lath Yarn. 11 "
Russia Hemp Tar'd Cordage. 13 "
American Hackled Hemp Tar'd Cordage. 12 "
Tar'd American Lath Yarn. 13½ " The following circular explains itself: NEW YORK, Sept. 10th, 1877

We beg to call attention to the price of the Geneva Hand Fluter, viz. : White Metal Base..... Six dozen in one shipment, discount 10 per

We have had complaints for some weeks that some parties were cutting above prices, and if our friends will give us definite information, we promise to stop it. We wish the trade to distinctly understand that the above prices must be held. Whenever or wherever we can get proof that any party or parties cut the price, we shall hereafter positively decline to sell at any price, either from Fac-tory or Store. Parties who are not willing to make a profit on a staple article like this,

we much prefer they would not handle it at all. W. D. Turner & Co., Manufacturers, Geneva, Ill. GRAHAM & HAINES, Sole Agents,

113 Chambers street, N. Y. Wilson, Walker & Co., proprietors of the Union Forge and Iron Mill, Pittsburgh, Pa., have issued a comprehensively illustrated catalogue of their specialties in Railroad Forgings suited to the requirements of railroad companies and car builders. They

have also issued the following circular:

pounds up to 4000 pounds, and are of capacity to do any kind of work up to forgings

of ten tons in weight.

We shall be pleased to give prices on heavy or light Steamboat Shafts, Cranks, Pitmans, Capstan Spindles, and all other kinds of Steamboat or Machine Forgings; also on Locomotive Frames, Driving Axles, Passenger and Freight Car Axles, Equalizers and other locomotive or car forgings. Solic-iting your orders, Respectfully yours, Wilson, Walker & Co.

and Furniture Knobs with porcelain and Walnut street, Philadelphia, have placed Wire Screw Eyes with gimlet points, Bright lustration of which will be found on the 20th Eyes, etc. They show a line of Tinned Meat page. It is placed on the market at \$6.50 per Hooks, and among their special goods made Rivets, Dowel Screws and kindred articles. They also show some handsome full size cuts of Tassel Hooks, Rack Pulleys, and an assortment of Brass Pulleys. The following discount sheet accompanies the book:

Picture Nails, Curtain Pins, Mirror Supports and Screw Supports: Dis. per cent.
On all orders amounting to \$75.00, net......50

all Picture Nails (except Brass Head), Curtain Pins, Mirror Supports, Screw Supports, Picture Knobs, (Flat-Head Screw, and Picture Hooks, may be assorted to make up the \$75.00 or \$40.00 order.

may be assorted to make up the \$75.00 or \$40.00 order.
Parties having purchased the \$75.00 or \$40.00 amount at the beginning of the season, are entitled to the same discount on small orders during the balance of the season. Seasons run from January 1st to July 1st, and from July 1st to January 1st.
Picture Knobs, Flat-Head Screw.

Picture Knobs, Flat-Head Screw.

Picture Hooks, Brass.

Nails, Brass and Silver Capped.

Screw Eyes.

55. 10, 10, 7 Hitching Rings..... Special Goods.
Special Goods subject to contract.
Staples, and Hooks and Staples.
Keys and Cotter Pins, less than 2000.

Loose 50, 10, 10
Escutcheons, all kinds 50, 10, 10
Escutcheon Plates 50
Discs for China Nails 10
Escutcheon Pins 10
Escutcheon

BRITISH IRON MARKET.

Wednesday, Sept. 12, 1877. Scotch Pig.—The market has fluctuated up and down since last report, but became steady toward the close, and there is now a fair business doing. The following are makers' quotations:

 Coltness No. 1...
 67/

 Glengarnock No. 1...
 59/6

 Eglinton No. 1...
 55/6

 feature to note.

the market is decidedly more hopeful than at our last writing, with a corresponding tendency toward increased firmness. The only important transaction reported is the sale of 4,000 tons of Iron for pipe purposes future delivery, private terms. Beyond this we hear of the usual weekly sales for immediate consumption, which aggregate several hundred tons. Prices remain as previously quoted, viz., Foundry No. 1, \$18@\$19; Foundry No 2, \$17 @ \$18; Gray Forge, \$16 @

Scotch Pig.-During the week 75 tons of Carnbroe, to arrive, were sold on private terms. The market continues strong in its tone at our quotations, with no perceptible improvement in demand. We quote : Glengarnock, \$25 @ \$25.50; Eglington, \$24 @ \$24.50; and Coltness, \$26.50 @ \$27.

Rails.-The demand for Rails improve In Steel we do not learn of any transactions, while in Iron Rails the sale of 3,000 tons on private terms, New York de livery, is reported. We quote: Iron, \$33 @

\$38, and Steel, \$45 @ \$47, both at mill.
Old Rails.—We hear of the sale of 1,200 tons Old Rails on private terms, and quote \$19 as the nominal price.

Scrap.-Wrought Scrap has been offered in this market during the week at \$22, an exceedingly low price. Sales are reported 99 Chambers street, have issued the following revised price list for "American" Meat Choppers and Silver's Sausage Stuffers, and hammer and blacksmith departments of our We quote the same from yard \$22 @ \$23. of 500 tons No. 1 Wrought on private terms.

Fruit and Jelly Presses, for which they are agents. This list is subject to discount 25 works, we are now prepared to fill orders for any kind of forgings or heavy black-smith work.

Manufactured Iron.—This branch of the Iron trade continues in the dull and lifeless smith work. long time; the low prices which are ruling have little or no effect as a stimulant to intending buyers, and we hear of no transactions worth naming. We continue to quote Common Bars, 1.75c. and Refined 2c.

METALS.

Copper.-A good many rumors have been afloat about some large purchases in this market, said to have been made by English speculators, and summing up between 4,000, The T. C. Richards Hardware Company, of West Winsted. Conn., have just issued, under date of August 1, 1877, an illustrated catalogue and price list of General and francy Hardware and Brick Wirs goods. Fancy Hardware and Bright Wire goods account has been consummated, we strongly manufactured by them. The book is printed incline to the belief that this scheme, apparmanufactured by them. The book is printed on heavy tinted paper and covers 54 pages, on which are shown 278 illustrations, all of which are fine specimens of engraving, and are particularly comprehensive for the reason that a large majority of the cuts are full size. Among the goods shown are a large assortment of Richards' Patent Slidehead Picture Nails and Curtain Pins, Picture and Furniture Knobs with porcelain and furniture Knobs with porcelain and formed the first page 1. In the belief that this scheme, apparantly contemplated for some time past, has been carried out. By obtaining control of a large amount of our Copper, the English operators would be able to exercise a powerful influence on both sides of the Atlantic at this juncture; our own market would be relieved, and by obtaining cheap a first-class article of fine Copper they would be able to regulate the English market so far as the more desirable kinds are concerned. But however this may be, and without underand Furniture Knobs with porcelain and fancy heads, Fancy and Plain Brass Picture Hooks, Wrought Iron, Brass and Silver-capped Picture Nails; a full line of Bright Wire Screw Eyes with gimlet points, Bright Wire Screw Hooks, both bent and straight; Gate Hooks and Eyes, Cornice Hooks and Eyes, cornice Hooks and Eyes, and an anong their special goods made to order are illustrated Bolts and Nuts, Rivets, Dowel Screws and kindred articles. practicable somewhat lower limits for round parcels. Tough Ingots we quote £75: Best Selected, £76: Sheets, £81, and Yellow Metal Bolts, 63/d." For manufactured there is a moderate demand and prices are without change; we quote New Sheathing Copper, 28c., and Bolts and Braziers, 30c.; Yellow Sheathing Metal, 20c. for Domestic and 16/2c. for Foreign; Yellow Metal Bolts, 25c.; and Nails, 20c., net cash.

Tin.—Our market does not show a particle of animation and sales are insignificant. practicable somewhat lower limits for round

ticle of animation and sales are insignificant. Of Straits 2277 slabs have arrived here during the week, and for large parcels thereof 15c., gold, is the outside price. Some 3000 to 4000 slabs now in Boston are being pressed for sale in this market without being pressed for sale in this market without finding buyers. We quote, in gold, at the close: Straits, English Refined and Australian, 15c. @ 15½c.; L. and F., 14½c.; and Banca, 17c. @ 17½c., all gold. By cable we learn that Straits has dropped to £64 in England, while at Singapore it was still \$19.25, with an exchange of 3/11. By mail from London, Sept. I, we perceive that Australian then already had for a moment touched £63, 5/, while Straits at the time touched £63. 5/, while Straits at the time still stood at £65. This clearly shows that Australian is carrying down prices of other sorts to lower and lower depths. The Tin Plate market has become quiet once more at Plate market has become quiet once more at the following closing quotations, gold, per box, ordinary brands, large lots: Charcoal Bright, \$6.50 @ \$6.75; ditto Ternes, \$6 @ \$6.12½; Coke Tin, \$5.70 @ \$5.75; and ditto Ternes, \$5.50. By mail from Liverpool, under date August 30th, they express themselves to the following effect:

"Coke Tin orders, makers find, are secured by present small reductions in price, but this is not their experience with Charcoals, which is not their experience with Charcoals, which continue in very small demand. For de-livery over next two months, makers are quite prepared to accept to-day's rates, a pretty good index of their opinion of prospects in

Lead.—The downward course of this metal has not been arrested for a moment, and after a few minor sales of Common Domestic of about 50 tons at 4.90c., currency, 150 tons Refined sold at 478c., currency, and we doubt whether for a larger lot of Com (Specially reported by cable for The Iron Age.) mon Domestic an offer of 43\(\frac{1}{3}\)\(\chi_{\chi}\)\(\chi would, we believe, not bring over 4%c., currency, and might possibly be procurable at 4.8oc., currency. On the Pacific side they have virtually reached the export point a little over 40 currency. point, a little over 4c., currency, from San Francisco, and if China will take their lead freely, the interesting problem will have been solved of overproduction forcing an export trade of American Lead to countries Manufactured Iron and Rails without in Asia consuming enormous quantities of this metal. This will eventually be an im-IRON.

American Pig.—Without being able to report any increased activity, the tone of the market is decidedly more hopeful than factured, there have been no further changes; we quote Bar 7c., Pipe 7½c., Sheet 8c., and Tin-lined Lead Pipe 15c.—all less P cent. to the Trade.

Spelter and Zinc.—Some 30 tons choice

the immediate future.

Western Spelter were placed at 6½c., currency, and we quote the range for all qualities on 5 %c. and 6 %c., currency. The market, although not very active, is firm in vi of the light stock available. In Refined, nothing has transpired, and we quote the same as heretofore, 834c. @ 9c., currency. Foreign we could only quote nominally, there eing none here, and none that we hear of afloat. In England there has again been a slight giving way, while in Germany the markets are sustained, notwithstanding a dragging sort of business. Sheet Zinc i without alteration; Mosselman, Sc. @ 8½c. gold, and Domestic, 71/8c. @ 71/2c., cur-

Nickel .- The market is moderately ac tive, and remains steady. We quote the entire range, \$1.70 @ \$1.90, gold.

Antimony is gaining in strength, stocks now being within easy control, and a mod-erate, but satisfactory trade doing. We quote this metal 11%c. @ 12c., gold. London continues stiff, but is no higher.

OLD METALS, PAPER STOCK, &c.

The market for Old Metals, Paper Stock, Rags, and other junk materials has continued without any especial feature of interest dur-ing the past week. Business remains inac-tive and prices are about the same as last quoted. There is still but little call for Old

Metals. Manila Rope is in good request and The purchasing prices offered by dealers for Old Metals are as follows:

for Old Metals are as I	ollows	į.		
Copper Yellow Metal Brass, heavy Brass, light Composition, heavy Lead, solid Tea Lead Zinc Pewter, No. 1 Pewter, No. 2 Spelter Wrought Iron Light do Stove Plate Machinery do	.08/2 .17 .04 .03/2 .13 .08 .05/2 18.00 12.00	33333333333		per lb
Burned Iron	4.00	0		**
follows: Canvas, Lineu. Cotton, No. 1. No. 2. White No. 1. No. 2. Colored do Mixed, Woolen Soft, do.			5%c. 6 2%c. 6 5 c. 6 3 c. 6 2 c. 6	7 5 C.
Junny Bagging	******		2 C. 6	6
Kentucky Bagging Book Stock Newspaper Stock Waste Paper and Scraps			21/4C. 6 2 C. 6 1/2C. 6	6 h 2¼c.
Kentucky Bale Rope Cakum Junk, No. 1				7 5 C.
No a				10

EXPORTS

Of Hardware, Iron, Machinery, Metals &c., from the Port of New York, for the Week ending Sept. 11, 1877:

Hamburg.		British Honduras.		
Quan. Brit. ware, cs. 7 Sew. mach., cs 49 Belting, cs 6 Hdw., pkgs. 14 Mf. iron, pkgs 10 Spelt'r, plates 1367	\$1,185 840 1,212 1,112	Quan. Value. Hdw., pkgs 16 232 Nails, kegs 34 86 Mach y, pkgs. 8 163 Havre. Copper, bbls 329 89,500		
Mach'y, es 4	1,738	Mach'y, cs 38 2,718		
Ag. imp., cs 4 Pl't'd ware, cs. 7	275 1,748	Malaga.		
Bremen.		Pumps, pkgs. 13 1,350		
Ag. Imp., pgs. 12	590	Cuba.		
Hdw., cs 45 Lamps, cs 5 Mf. iron, pkgs. 17 Pumps, pkgs. 2	1,556 250 229 200	Saddlery, cs 1 223 Nails, kegs 45 116 Hdw., pkgs 181 4,121		
Dutch West Inc		Sew. Mach., cs 373 4,944 Mf. steel, pkgs 16 101		
Metal, cs 2 Hdw., pkgs 5t Barrows 6o Mach'y, pkgs 3	190 924 75 148	Mach'y., pkgs. 139 1,313 Mf. iron, pkgs. 670 4,945 R.R. mt'l. pgs.1138 6,750 Lamps, pkgs. 6 257		
Liverpool.		Cutlery, bxs 10 635 Boilers 2 3,221		
Hdw., pkgs 54 Tel. insts., cs. 2	4,056	Porto Rico.		
Mach'y, cs 4 Pumps, cs 2	800 250	Hdw., bxs 20 540 Nails, kegs 50 135		
Clocks, pkgs. 52 Sew, mach., cs 16	2,400	Hayti.		
Brakes, cs 8 L'p. g'ds., pgs 25 Ag. imp., pkgs 6	1,075	Hdw., pkgs 116 412 Mexico.		
Ag. imp., pkgs 6	250	Mf iron place &c . con		

Mexico Mf. iron, pkgs. 85 Machy., pkgs. 34

British North Amer-ican Colonies. Nails, kegs... 100
Hdw., pkgs... 12
Mf. iron, pkgs. 61
Iron ore, tons. 178
Iron safes.... 2
Axles..... 25 Venezuela. Hdw., pkgs... 93 Lamps, pkgs... 42 Mf. iron, pkgs... 4 Cutlery, bxs... 9 Sew. mach.. cs 9 British West Indies.

Hdw., bxs... 146 Clocks, bxs... 688

Glasgow.

Clocks, bxs... Ag. imp., pkgs Belting, cs.... Wringers, cs...

elting, cs...

Lamps, pkgs... 13 Hdw., pkgs... 127 Mf. iron, pkgs 28 Clocks, pkgs... 6 Cr'ge mtl., pgs 62 Nails, kegs... 235 Lamps, pkgs.. 41 Sew. mach., cs 16 British Australia. 407 789 Mf. iron, pkgs. 25 1,275 182 Ag. imp., pgs. 8 480

IMPORTS

Of Hardware, Iron, Steel and Metals into

ing Sept. 11, 1877	ork, for the Week end-
Hardware.	Whitney A. R. & Bros.
Althof, Bergman & Co Cases, 15	Tubes, 350 Without Bill of Lading, Bars, 2163
Berbecker J. & Co. Cases, 2	Bundles, 61
Boker Hermann & Co.	Steel,
Knives, cs., 6	Brown William, Bundles, 62
Scissors, cs., 1 Hdw., pkgs., 8	Cases, 7
Guns, cs., 3	Frith Edward Mdse., pkgs., 15
Drexel, Morgan & Co. Cutlery, cs., 1	Mitander Nils,
Ely & Wray Cases, 1	DCS., 410
Folsom H. & D. Mdse., pkgs., 8	Prosser Thos. & Sons, Packages, 130
Fisher J. L.	Sulzbacher, Hyman &
Baws & tools, ck., Harmer William & Co.	Bars, 147 Packages, 24
Mdse., pkgs. 3 Hecker P. J.	Order,
Case, 1 Langland & Co.	Bundles, 261 Casks, 13
Mdse., bdls., 120 Mdse., rolls, 16	Cases, 2 Metals,
Mdse., cks., 5	Ashby Morris.
Lamarche H. Arms, cs., 1	Zinc, cks., 20 Aikman James & Co.
Merchants' Dispatch Co. Arms, cs., 13	Tin plates, bxs., 217
Morse J. P. Sons,	Terne plates, bxs, 121
Arms, cs., 1 Mdse., pkgs., 5 McCoy & Co.	Cort N. L. & Co.
McCoy & Co. Mds., pkgs., 12	Tin plates, bxs., 1315 Dickerson, Van Dusen &
Owen A. Arms, cs., 6a	Co. Tin plates, bxs., 1203
Schoverling & Daly Mdsc., pkgs., 2	Francklyn C. G.
Wiebusch & Hilger Hdw. Co.	Lead hars area
Cutlery and Hdw., pkgs., 33 Anvils, 100	Lamarche H. Zinc, cs., 25
Wolffe S. N. & Co. Ironware, cs., 10	Merchants' Dispatch Co. Antimony, cks., 2
Ward Asline,	Naylor & Co. Tin plates, bxs., 1977
Mdse., pkgs, 4 Order,	Phelps, Dodge & Co. Tin pl'ts, bxs., 11,528

Lead, bars, 2350
Lamarche H.
Zinc, cs., 25
Merchants' Dispatch Co.
Antimony, cks., 2
Naylor & Co.
Tin plates, bxs., 1977
Phelps, Dodge & Co.
Tin plates, bxs., 115,38
Scheider Jas. & Co.
Lead, pigs, 2300
Ther.
Lead, pigs, 5574
Tin plates, bxs., 16w
Terne pl'ts, bxs., 667
Tin and terne plates, bxs., 687
Tin and terne plates, bxs., 437
Tin, ingots, 330
Antimony, cks., 50
Without Bills of Ladding
Tin plates, bxs., 7236
Tin plates, bxs., 7236 Iron. Kidder, Peabody & Co.
Bars, 2, 188
Marvel W. D.
Ore tons, 600
Mitander Nils,
Swedish bar ends.
Boxes, 351.
Sampson Geo. G,
Pig tons, 100

ler, Per. caps, cs., 4 Cases, 4 Casks, 1

The condition of the trade during the pas The condition of the trade during the past week has altered very little from that of the week previous. There is a brisk demand for Coal, and those who have it for sale are pretty well filled with orders. The manufacturing sizes are reported scarce by some dealers. At the present time there is com-paratively little Coal in the market, although the tonnage from those regions still at work has increased enormously. For example, the Philadelphia and Reading during the week ending September 1 carried 178,000 tons, against 64,000 tons for the same week For the four weeks ending September 1, 1877, this road carried some 630,000 tons of Coal, while in the previous year, during the same time, the amount was 30,000 tons. Mr. Saward's tonnage figures brought lown to date show that from the Wyoming region, now idle, nearly 600,000 tons more Coal were produced this year than last. The Lehigh Coals also show about the same increase in production for the year, while for the Philadelphia and Reading road the onnage is nearly 1,600,000 tons ahead of last year, and is rapidly increasing.

Reports from the regions show that there

are signs of weakness among the men. There are more discontented ones and more who speak their discontent freely and aloud. It said by some operators that they would ave no difficulty in going to work at once they would compromise with the men. if they would compromise with the men. Most of the companies and operators, however, are very determined, and it is probable that the men will yield first. Some idea of the state of the coal trade can be gathered from the fact that yesterday morning there was a considerable drop in coal shares resulting from a rumor that work had been resumed in the Wilkesbarre region. Delaware & Hudson fell from 51½ to 47¼, D., L. & W. from 53 to 50, and so on. In Trinity building dealers and agents

In Trinity building dealers and agents remarked that an immediate resumption might cause a small break in Lehigh prices to the extent of perhaps 15 or 20 cents. If to the extent of perhaps 15 or 20 cents. II, however, resumption does not take place until the 1st of October, the opinion prevailed that the present prices would be maintained. Lehigh Broken and Egg are quoted \$3.65; Stove, \$3.75; Chestnut, \$3.50. The Philadelphia and Reading prices are so high as to put this coal practically out of the market

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, September 12, 1877.

Business has been generally very quet during the past week, which in some degree seems to have shaken the confidence of those who were expecting an immediate resump-tion of old-time activity. In point of fact, it may be plainly stated that in nearly all departments of trade the past week was one of very general dullness and depression. Notwithstanding these little relapses, there is the utmost confidence in regard to the future, as it is well understood that it will be some months yet before the crops are mar

keted and the effects realized. Pig Iron.—The market is not at all active, and although generally steady and firm, there are exceptional cases of weak-ness and consequent yielding in prices. The demand runs chiefly on special brands, and these are easily placed at full quotations. No large lots are sold, but orders are frequent, and there is therefore no accumula tion of stock. Outside lots are not so easily placed, and there is a degree of irregularity and uncertainty in regard to these which to some extent affects the whole market. The past few days, therefore, have not developed any additional firmness-first, for want of an active market; and, second, because of renewed anxiety by certain parties to realize on their product. As we said before, the leading and more favorite brands, under a steady demand and light stock, are firmly held, and on such no concessions can be obtained, but Iron of all grades can be had in quantity for prompt cash, at the low-est figures of the whole year. One of the leading buyers informs us that the purchases made by his firm have been at lower price each month from January to date, the pres-ent month included. There is no doubt, however, that the trade is in a better position generally than it was some weeks since, and it is quite likely that the tendency will be toward further improvement. Buyers of small lots have to pay a little more money, and various trifling concessions that were made during the summer are not allowed now; even the best class of buyers find it increasingly difficult to place their orders at anything below regular quotations, and sales at extremely low prices are exceptional and not to be regarded as an indication of the general market. The demand, however, is very disappointing, and the volume of business shows no perceptible increase in view ness shows no perceptible increase, in view of which it is surprising how steadily prices are maintained. The feeling in regard to the future is still one of confidence, and al-though no special change in values is looked

Plate and Tank Iron .- The demand continues to be less active, and there are complaints of dullness and depression from all quarters. This branch of the Iron trade hitherto has been fairly active, and gave promise of being permanent, but the present outlook is quite discouraging. There are no important contracts on hand, and the mills are nearly all running on small orders re-ceived from day to day. Others are em-ployed on making up stock, or are running only part. Under these circumstances com only part. Under these circumstances copetition is sharp, and prices somewhat regular. We quote same as last week: Ship Plates, 2.37½c. to 2.50c.; Tank Iron, 2½c. to 2%c.; Shell Iron, 3c.; Flange Iron,

4c. to 4½c., and Best Bloom, 5½c. to 6c. Sheet Iron.—The demand in some in-stances is reported less active, while others seem to be fully employed. There is prob-

absolute certainty, as buyers adhere closely to the plan of purchasing only as their needs may require. Caution seems to be a leading feature of the trade, and what business is done will be on a safe basis. If there is any genuine improvement in business it will be felt at the mills immediately, to carry stocks. We quote for large lots: Refined Sheet Iron, No. 26 to 28, 334c.; No. 26 to 24, 34c.; Best Bloom Sheets, No. 26 to 28, 54c.; No. 22 to 24, 34c.; No. 16 to 21, 34c.; Refined Sheet Iron, No. 26 to 28, 54c.; No. 22 to 24c.; No. 16 to 21, 3c.; No. 26 to 28, 54c.; No. 22 to 24c.; No. 26 to 28, 54c.; Refined Sheets, No. 26 to 28, 54c.; Refined Sheets Iron, No. 16 to 21, 34c.; Refined Sheets, No. 26 to 28, 54c.; Refined Sheets Iron, No. 16 to 21, 34c.; Refined Sheets Iron, No. 16 to 21, 34c.; Refined Sheets Iron, No. 16 to 21, 34c.; Refined Sheets Iron, No. 26 to 28, 54c.; Refined Sheets Iron, No. 26 to 28, 24c.; Refined Sheets Iron, No. 26 to 28, Plates or Blue Annealed, 5-10 to 16, 23,6.; American B. G., 5-16 to 18, 3½c.; Best Bloom, 5-16 to 18, 5c.; A. Patent Planished, 11c.; B. Patent Planished, 10c.; Bloom Galvanized, 40 per cent.; Refined Gal-vanized, 50 per cent.

Bar Iron.—There is not the least improvement to note, and the demand is as light and unsatisfactory as ever. Competition, and unsatisfactory as ever. Competition, of course, is keen, and prices very irregular. Consumption is so light, however, and the requirements of buyers so trifling, that business is in a very small compass, and, as we remarked last week, cannot be forced by reducing prices. The experiment has been tried, both by our city manufacturers and Pittslaurch firms but the result was called. manufactured Iron.—Business confusions. Out of regard to the feelings of our Western friends we will forbear giving details, but we may say that the most alluring offers made by a representative of one of the leading firms failed to find the slightest response from buyers here. In fact, it is felt even among buyers that good Iron cannot be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and be furnished at the prices at which it has been offered, and while most of the mills are running, very few if any of them are working up to anything like their full apacity. Many of the puddling furnaces have not yet been lighted up, most of the mills are running, very few if any of them are working up to anything like their full apacity. The for Cast; 10c. to 12c. for Blister; 8c. for American Spring; 13½c. to 14c. for Cast; 9c. for Blister; 8c. for American Spring; 13½c. to 14c. for Cast; 9c. for Blister; and in little demand. Small sales are made hereat tyc. to 20c. For Manufacturers we we will any of the puddling furnaces have not yet been lighted up, most of the mills are running, very few if any of the mills are running, very few if any of the mills are running. Yet to 10c. for Cast; 10c. to 12c. for Blister; 12c. to 12c. for Blister; 24c. to 12c. for Blister; and in little demand. Small sales a can be had in this vicinity quite as cheap as it can be furnished from distant points. In plain terms, it is not believed that a firstclass quality of Iron can be sold for less than class quantry of fron can be sold for fees than our quotations, and anything at a less price must be of a quality to correspond. We quote: Common fron, 1.60c. to 1.75c.; and Best Refined, 2c. to 2.1c.

Muck Bar.—There is not much doing and

orices are almost nominal. It is offered, Philadelphia delivery, at \$32 to \$34, accord-

ng to quality.

Steel Rails,—There is no important change to note; there is a fair business doing in small lots, but no large transactions are reported. The outlook is considered are reported. The outlook is considered favorable, and it is expected that sales will increase considerably within the next 30 days. In the meantime purchases are nearly all in lots of 200 or 300 tons each, for which full prices are obtained. Buyers of large lots for cash and prompt delivery would lots for cash and prompt delivery would probably obtain some concessions, and although in quiries are numerous, they have not as yet led to much business. Some of the roads, it is believed, will be compelled to purchase soon, as they are badly run down, and the prospects of a heavy traffic during the winter make it absolutely necessary for them to improve their roadway. It is muite likely, too that some orders for large s quite likely, too, that some orders for large lots will be placed before winter, and in fact we hear of a sale of a 3000 ton lot to-day at a price not named, but in all probability at something less than regular quotations. We quote about \$44 to \$45, cash, at mills, as the basis of late sales. Street Rails, \$53 to \$55.

Iron Rails.—There has been very little new business done, the only sale reported being a lot of 2600 tons. There are several rders in the market, including one from uba, but as yet they have not offered sufficient inducement to attract the favorable consideration of sellers. With a general improvement in trade, it is quite likely that the Iron Rail mills will realize a better demand for their products. We quote according to section, quality and terms, \$31 to \$35 cash, at mills. Some sales of Street Rails are reported; terms private.

Old Rails are offered freely at \$19, and in one instance we know of them being refused at \$18.50. Sales reported are at \$18.50 to \$19, with sellers at same prices. The demand is light, however, and the tend-ency of the market is toward lower prices. We quote \$18.50 to \$19.50 as covering the whole market. Sales of old Street Rails at

Old Car Wheels .- There is scarcely any emand, and prices are nominal at \$18.50 to 619.50, last sale reported being \$19.

Uld Car Axles.—No recent sales reported, although buyers are in the market at low

Sellers hold at \$26 to \$28, according Scrap Iron,-There is no change to note.

but the market is very dull, and the demand light. We quote as before: Wrought \$22 to \$23; Cast \$15 to \$16.50.
Nails.—The demand is quite satisfactory

and prices are generally steady and well maintained, although there are rumors of cutting. Some large sales are reported— one firm alone will ship nearly 30 cars this week. We continue our quotations of last cutting. week, \$2.40 to the trade, and \$2.50 to con-

Lead . - The demand is still very light and though no special change in values is looked for, it is probable the tendency will be slightly upward. In the meantime we quote the market steady at the following figures: No. 1 Foundry, \$18 to \$15; No. 2 Foundry, \$17 to \$17.50; Gray Forge, \$16.50, with special brands held at \$1 to \$1.50 per ton here. the trade

PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue, PHYSBURGH, Sept. 11, 1877.

Pig Iron,-There is more doing, and rumors prevail of some few round lots having changed hands, but the inquiry, as a rule, is still for small lots, to supply immediate wants, and the probability is that buyers generally will adhere to this policy for some time to come. Sales of large lots can only be effected by offering inducements, and in the present condition of affairs there is no incentive on the part of consumers to anticipate future wants, unless concessions bew current rates are offered, as there is no probability of any immediate advance, and a possibility of a further depreciation, notwithstanding the general belief that hard pan has been touched. The very best brands of Western Gray Forge Red Short cannot fairly seem to be fully employed. There is probably a fair average business doing, but in
small lots, which may or may not be permanent. For the time being business is
satisfactory, but the outlook is not one of
satisfactory but the outlook is not one of

ducing the latter down to the very lowest limit; and only those in need of money will sell the grade below, or even at the figures named. Moreover, it is not expected by provide is quoted at \$1 per ton at mines and \$2 to \$2.5 colors. ducers that the cost of production can be reduced any further; fuel, if anything, is higher, while ore and labor—the latter in particular—are down to the lowest notch.

Petroleum.—It is reported that the son of the year, and then the using of so many old rails has largely curtailed the consumption of pig, the former being so much cheaper than the latter. Bituminous Coal, smelted from Lake Superior ore, may be fairly quoted as follows: No. 1 Foundry, \$25,50, 4 months.; No. 2 do., \$21,50; Gray \$25.50, 4 months; No. 2 do., \$21.50; Gray Forge, \$20 @ \$20.50 for red short, and \$18 to \$19 for cold short and neutrals. Rumored sale of 1,500 tons of mixed red short at \$17 cash. The Lucy Furnace Co. will start up an additional furnace; the "Soho" (Moorhead & Co.) will be started up very soon. The Isabella has been running one furnace for some time yast.

to do nothing than to work at a loss, and this stiffening has no doubt had considerable to do with the very light demand, as orders could be placed at lower rates elsewhere. It is reported on very good authority that the mills in the Shenango and Mahoning valleys have also stiffened up recently, and are now refusing orders at prices current there a few weeks ago. There is no question but these mills within the past few months obtained considerable trade at the expense of Pittsburgh, but the probability is that they have learned since the taking of stocks that the more orders they obtained at the prices they said about Pittsburgh having lost her prestige as being the great iron mart of the country, she is still able to meet competition, and in regard to quality her product will stand the most critical test with that of any other point. It is true that some of our manufacturers, in order to satisfy the clamor for something cheap, have used more or less old rails; but others, jealous of their reputation, have refused to let an old rail be seen about their mills. We continue to give 1.80c, to 1.90c. as the base price, with some few makers at 2c.

Nails.—There has been no perceptible change in the situation since the date of our last report; nearly all the factories, including those of Shoenberger & Co., Zug & Co., Chess, Smyth & Co. and Lewis, Dalzell & Co. are running and operations have also Co. are running, and operations have also Co. are running, and operations have also been resumed by most, if not all, the Wheeling makers. Stocks are known to be light both in hands of jobbers and consumers, and the prospect is still regarded favorable for a good fall trade. No change in prices; \$2.25, 60 days, for 200 kegs and upward; ten cents additional for smaller lots, and the usual discount of two per cent. for each. There is to be a regular meeting for cash. There is to be a regular meeting here to-morrow of the Western Association, and an advance in prices is not improbable if so the readers of The Iron Age will be

advised of it by wire.

Horse and Mule Shoes.—There is a fair ary with the jobbing trade to stock up about twice a year, but this year they do not seem disposed to anticipate future wants; hence business is not as active as it should be a this particular time.

Wrought Pipe.-Some manufacturer are reported as being pretty well supplied with orders, but there is no uniformity of prices, each firm or company making their own rates, and the trade in this particular respect is by no means satisfactor

Steel.—The general position of the market for this important article remains substantially the same as noted in our last report the demand keeps up well, the best evidence of which lies in the fact that the mills are generally busy, and no doubt is entertained but this will continue to be the case unti the close of the year. As frequently stated in these reports, the consumption of Steel is rapidly increasing; in consequence of its cheapness it is supplanting Iron for many purposes; and another effect of the low prices is to almost entirely stop importations from foreign countries. Nearly all the railfrom foreign countries. Nearly all the rail-roads are now putting down Steel instead of Iron rails, and this accounts for the fact that while the consumption of Steel has been steadily increasing for several years past, that of iron has been falling off.

Scrap.—There have been no recent sales of old rails, and the market continues very dull, for while there is no disposition to press sales. there are a good many on the market, and prices continue to rule in buyers' favor; the great objection is that they run even, and but for this the consumption here would be considerably larger than it is. Prices may be quoted at \$19 to \$20, 4 months, at which rates they are much cheaper than Pig Iron, but manufacturers, for the reasons stated, are afraid of injuring the quality of their product. Old Car Wheels are still quoted at \$20 to \$21 per gross ton.; No. 1 Railroad

Scrap, \$24 per net ton. Coke.—The trade is generally reported dull, and no material improvement can rea-sonably be expected while the Pig Iron mar-

breach so long existing between the Stan-dard and Empire Refining companies has been healed and that these two factions are The fact that crude is weak while refined is firm and higher, with considerable inquiry and no sellers, is regarded as pretty evident that an arrange-ment of some kind has been effected.

BOSTON.

SEPT. 8.-Iron.-Pig continues easy, with no change in prices. Bar continuchanged, quoting \$43 to \$45 for I and \$35 to \$36 for Common. Nails are in light demand at unchanged prices. Sheet is selling at 3c. to 3%c. per pound. old rails, and this accounts for the very light consumption of pig prices. We quote Pig 5%c. to 5%c., current of manufacturers, noted in our last report, still continues. This feeling has been more apparent since the taking of stock, and it is evident that mill men have sensibly concluded that it is better to do nothing than to work at a loss, and this stiffening has no doubt had considerable.

Tim is dull and depressed, with no change in Tim is dull and depressed, with no change in Tim is dull and depressed, with no change in Tim is dull and depressed, with no change in Tim is dull and depressed, with no change in Tim is dull and depressed, with no change in Tim is dull and depressed, with no change in the very light consumption of pig prices. We quote Pig 5%c. to 5%c., currency. For Domestic Sheet, 8c.; Pipe, 7%c.; Tin-Lined Pipe, 16c.; Bar Lead, 7c.; all of these, excepting Pig, are subject to the usual trade or 10 per cent. discount.

Antimony is quiet at 11%c. to 12%c., gold, for Boston spot lots, and Spelter is easy, to do nothing than to work at a loss, and the second prices. Tin is dull and depressed, with no change in prices. We quote Straits, 15½c. to 15¾c.; Banca, 18c. to 18½c.; Refined English, 15c. to 15¾c., gold. We quote Plates; Charcoal, I. C., \$7 to \$7.25; Coke, \$6 to \$6.25, and Terne at \$6.50 to \$7. gold.—Commercial Bulletin

CINCINNATI.

Messrs. L. R. HULL & Co., under date of Sept. 8, write us as follows: Pro Iron.— The movement moderate and buyers are not inclined to anticipate their wants to any considerable amount unless inducements are took them at the less money they would considerable amount unless inducements are have. Notwithstanding all that has been offered. Our quotations cover the range of

-	the market.
9	HOT-BLAST FOUNDRY.
	Hanging Rock No. 1, Char-
i	coal \$\fon.\$23.00 @ 24.00-4 mos.
	Hanging Rock No. 2, Charcoal 22.00 @4 mos.
y	" No. 1 Coke 23,00 @ 24.00-4 mos.
	11 No 9 " 22 00 @ 22 50-4 mos
r	" No. 1, Stone-
1	coal 21.00 @ 22.00-4 mos.
A	Virginia, No. 1 Coke 24.00 @4 mos.
9	Wo a 41 mare 6 more
t	Ala, and Tenn., No. 1 Chare'l. 22.50 @ 22.00-4 mos.
2	NO. 2 21.50 66—4 mos.
0	Red-short, No. 1 Coke @4 mos.
V	Shawnee No. 1 22,00 @4 mos.
1	Alice No. 1 ex 24.00 @4 mos.
. 1	Alice No. 1
9	FORGE TRONS.
r	Hanging Rock No. 1 Char-
-	coal
	Hanging Rock No 1 Coke 21.00 d4 mos.
9	Virginia, No. 1 20,00 @4 mos.
-	Ala, and Tenn. No. 1 Charc'l, 20,00 @4 mos.
)	Red-short, No. 1 Coke 22.00 @ 22.50-4 mos.
9	Cold-short, No. 1 Stonecoal. 19.00 \$ 20.00-4 mos.
	CAR WHEEL AND MALLEABLE.
-	Hanging Rock
1	Southern and Western Brands, 30.00 @4 mos,
	ORE.
1	Lake Superior 8.50 @cash.
1	Virginia Hematite (Washed) 4.25 @cash.
	4.20

CHATTANOOGA.

Specially reported by S. B. Lowe, Dealer in Metals, under date of Sept. 10: There is nothing new to note in iron. The Southern foundries are ordering their usual supplies as their wants require. There has been some inquiries for Old Rails from the North, degree of activity, as there usually is this some inquiries for Old Rails from the North, month, but no change in prices. Sheen-berger & Co. continue to quote at \$3.80 and \$4.80 for 100 keg lots. Special rates for larger lots. In former years it was custom-supply. Prices are about as follows: No. 1 Foundry, extra........\$20.00 @ 21.00

ee	No. 2 Foundry. 12.00 @ 20.00 No. 2 Foundry. 17.00 @ 18.00 Gray Forge 15.00 @ 16.00 White and Mottled. 24.00 @ 15.00
rs	BOT-BLAST CHARCOAL.
d	No. 1 Foundry, extra
of	No. 1 Foundry 19.00 @ 20.00
ir	No. 2 Foundry 17.00 @ 18.00
	Gray Forge 16.00 @ 17.00
J.	White and Mottled 15.00 @
	COLD-BLAST CHARCOAL,
te	Car Wheel Metal\$22.50 @ 27.50
l-	" extra 24.50 @ 29.50
	Forge Metal 17.50 @ 22.50
9	Muck Bar 29.00 @ 34.00
е	Old Car Wheels
е	Old Rails per ton 16,00 @ 17.00
d	Brown Hematite Ore 50 to 56 per cent.
il	Red Fossiliferous Ore, 50 to 56 per
d	
8	Nails 21-5C Bar Iron 2C
8	R. R. Spikes
9	Ingot Copper

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Sept. 10, write us as follows: There is a better feeling in the iron market than for some months; the demand for all grades is large and well maintained. Prices station-

ary. The usual time, 4 months, etc.
FOUNDRY IRONS.
No. 1 Hanging Rock, Charcoal
Coke 19,00 @ 20,00 No. 1 Southern, Stonecoal and Coke 19,00 @ 20,00 No. 2 11 18,00 @ 19,00
MILL IRONS.
No. 1 Charcoal, Cold-short and Neut'l. 18.50 @ 19.50 No. 1 Stonecoal and Coke, Cold-short
and Neutral
and Neutral 17.50 @ 18.00
No. : Missouri and Indiana Red-short. 21.00 @ 22.00 White and Mottled, Cold-short and
Neutral 15.00 @ 16.00
CAR WHEEL AND MALLEABLE IBONS.
Hanging Rock, Cold-blast 34.00 @ 38.00

W. B. BELKNAP & Co., Iron Merchants, Louisville, Ky., under date of Sept. 10, report business in Iron and Nails continues Mills here and at Cincinnati behind with orders, and good Merchant Iron may be quoted firm at from \$1.90 to \$2. General trade is likewise active, the railroads centering here reporting a larger business than ever done before, except during the

BALTIMORE.

Messrs. Wyeth & Brother, Iron and Steel Merchants, 46 and 48 South Charles street, report us the following prices, under date of Sept. 10: This market continues to improve, with moderate stocks to meet current wants, which are held firm at quotation figures.

AMERICAN REFINED BAR IRONS.

Messrs. R. C. Hoffman & Co., from and Commission Merchants, No. 23 South Fred-erick street, report the Pig Iron market as follows, under date of Sept. 10: While the Pig Iron market shows no improvement In prices, yet we have increased inquiry for best grades of wheel iron, and a more cheerful feeling in the market. We quote present prices as follows: Roltimore Charcoal..... Anthracite No. 1.

ST. LOUIS.

White and Mottled ...

Specially reported by Messrs. Spooner & Collins, Iron Commission Merchants, 217 North Third street, St. Louis, under date of Sept. 6: The demand for Pig Iron is very good, and the prospects for a brisk trade this month are better than any month during the year. Prices, however, remain about the same, and any possible advance is at the present time improbable.

	No. 1.	No. 2.	Mill.	White and Mot'ld
Missouri Stone Coal	\$22,00	\$21,00	\$20.00	\$19.00
Missouri Charcoal	22.00	21.00	20,00	20,00
Tennessee Charcoal Southern Coke, very soft	22.50	21.00	20,00	19.00
and strong	23.00	21,00	20.00	18.50
Hanging Rock Charcoal H. R. Charcoal, Cold-	25.00	24.00	23.00	
short	24.00	23.00		
	Extra		B.	
	No. L.	No. I.	No. I.	No. 2.
Hanging Rock Coke		24.50	24,00	22,00
West Virginia, Coke	23,50	23.00	22,00	21.50

COLD-BLAST CHARCOAL-All Numbers. entucky issouri... anssouri Georgia. Alabama Assorted Bar Iron No. 1 Railroad Machinery Scrap Heavy Cast "Light Cast "Old Rails." Old Car Wheels

RICHMOND.

Mr. Asa Snyder, Iron Merchant and Furnace Agent, Richmond, Va., writes as foliows under date of Sept. 10: Charcoal Pig Iron is still inactive; a fair business in general foundry grades has been done the past week. Quotations are unchanged.

Va. Cold-blast Charcoal, Cold-short. \$21.00 @ 25.00 Va. " Neutral 29.00 @ 31.00 Anthracite, No. 1 X. 20.00 @ 21.00 Mo. 2 X. 19.00 @ 20.00 " No. 2 X. 19.00 @ 20.00 Coke, No. 1 X (West Virginia) 22.00 @ 32.00 @ 33.00 Coke, No. 1 X (West Virginia).....

FOREIGN.

FRANCE

FOREIGN.

TAINED.

Lifetimes for here with state-office and the condecided has been desirable and the condec

(Revue Universite).

Brussels, Aug 26, 1877.—Metris,—On Wednesday last bids were opened in an adjudication upon 16 locomotives with "Belpaire" grates, of the weight of 30,500 to 31,000 kilos, each. Awarded to Messrs. Carels, of Ghent, as the lowest tender, at 38,440 france seal, or about 1.48 franc per kilo, a low figure, which leaves no profit. This shows how anxious some locomotive builders are to keep going. The rolling mills also work at low rates, but at these they have plenty of orders. Thin Sheet Iron for boilers is wanted for export, and special Iron is also more active. Pig Iron, Affinage as well as Moulage, remains in a depressed state under English competition, which has the sway of our markets, and our blast furnaces are doing little in consequence. The semi-monthly line of steamers between Antwerp and Algiers has begun its service, and increases our relations with that promising French colony. Cod.—The government adjudication for upward of 20,000 tons Coal for the State railroads has come off, showing that low mixed quality has evidently not yet touched bottom, while medium quality, especially in the Liege basin, is looking up.

GERMANY.

(Borsenhalle).

Hamburg, Aug. 25, 1877.—Metals.—Business in this line of trade begins to improve but slowly, although most of our merchants and consumers have returned from their summer retreats, and there is now nothing to impede the opening of the fall season. The crops are about average ones, money is still comparatively cheap, and stocks of metal in the interior are moderate. Under these circumstances, and considering the low price of metals, confidence should revive, and with it activity; but there is the same spirit of caution manifested which has characterized the German markets during the past few years, and very fittle, if any, inclination to speculate or anticipate wants. Copper has been quiet. Berlin quotes English and Australian 75.55 to 78.50. No change here. Tin.—Our markets are manimate, and we are nominal and unaltered here, but the general tendency in the German markets is downward. Berlin quotes Banca 75 to 75.25, and English 72.75 to 73 marks the 50 kilos. Lead is inactive and nominal, without any change here. Evilin quotes as the range for all sorts 20.75 to 20.85 marks the 50 kilos. Spetter.—There is increased firmness, and Berlin now quotes 10.50 to 20 marks the 50 kilos. No alteration here. Weslau, though less active, firmly maintains late prices.

HOLLAND.

HOLLAND.

(Koch & Vierboom.)

ROTTERDAM, Aug. 28, 1877.—Tin.—After Banca and Billiton had dropped a couple of days ago to 40 and 38 guilders the 50 kilos, respectively, holders made a sudden stand and withdrew, insisting upon 40.25 and 38.50, but their stiffness has vanished again since, and a few isolated sales are already leaking out at 40 and 38 for each kind, respectively. Market dull.

CHINA.

(Arnold, Karberg & Co.)

(Arnold, Karberg & Co.)

(Anton, July 27, 1877.—Coul.—Our market continues in the same depressed state. Stocks have been further augmented by recent arrivals, and importers are more or less anxious to effect sales, while consumers continue to exercise the greatest caution in declining to operate at the rates now demanded, although these show anything but a margin on home cost. Values of Cardiff Coul have receded to \$9 for distant shipments, and \$9,50 on the spot, and some sales are rumored at the former figure. Australian Coal may still be quoted \$8 6,8.25 for arrival, and \$8.50 on the spot, but the demand is quite lifeless, and no sales have been made public during the past fortnight. Prospects altogether are very gloomy, and there seems to be no chance of any immediate improvement, unless the low rates now current should attract the attention of speculators.

EAST INDIES.

(J. Peet & Co.)

BATAVIA, Java, July 16, 1877.—Tin,—The shipments of Tin from Batavia to the United States during the year ending 1st instant, have been but 20 tons, against 19 in 1876, and 16 in 1875. On Monday, the 14th proximo, about 10,000 piculs Billiton will be sold by public auction here; the last sale, 11th ultimo, averaged 45,18 guilders per picul. Cool.—Sales of English, West Hartley, and Cardiff were effected three weeks ago at 25 guilders per ton, and Scotch have, we hear, been placed at 18,50. The demand is, however, very inactive, and large quantities calling at Anjer and afloat direct are being pressed upon the market, so that a sharp fall in prices appears inevitable. Arrivals of Australian are the Mater and the Ned White to consumers, the Gamen, sold to arrive at 10 guilders per ton, 6 months' credit, and the Holland City, sold at a price kept secret, but supposed to be about 12,50 per ton. Exchange.—Sterling rates have declined to 11,00 for bank bills, and 11.85 for private paper, 6 months' sight on London.

(Dumnler & Co.)

BATAVIA, July 16, 1877.—Metals.—The demand continues in general very languid, and there is again little to report in regard to the state of our market. The altered quotations are, with few exceptions, lower, and mostly the result of transactions so very insignificant that in other years they would scarcely have drawn attention, but which must satisfy importers during the present season. As long as arrivals exceed actual wants, and no confidence can be placed in dealers, no improvement can be looked for in the present miserable position, Iron.—A sale of Swedish, to arrive, is reported at 11 guilders; English is quiet. Copper Sheathing without demand.

of the last-named colony. Iron.—The tendency in the French Iron markers is still a favorable one. The fron masters of the Sambre group have advanced prices a france. In the Hand-Marne the roughlifted delight to the English rolling mills are quite busy, and some have been unable to come up with accumulating orders yet to be filled; thin Sheet Iron is also in brisk request. Machinery and Hardware are however neglected. In the Franche Comte the better species of Pig Iron sell at 150 frances. In the Rhone and Loire bash, architectural ironwork is in a good position but outside of the government commands for the army and navy but few orders are being received. The railroad companies for some time past have ordered little. Coal is still languishing, the Iron works still languishing, the Iron works still languishing, the Iron works still languishing the proposed does not yet manifest itself, as it is still too early in the season.

The french Iron markers is still a favorable one. The front markers is still a favorable one. The iron markers is still a favorable one. The front markers is still a favorable one. The front masters of the Sambre group have addition to the English the trailes of the United Kingdom to the dender advice and assistance to individual associations when beset by an organized combination of capital." The programme for the congress will shortly be taken, inasmuch as such to english the trailes of the United Kingdom to trail front and arbitration; associations when beset by a tional British distrust of Russian policy—so that one hardly finds a single person who expresses sympathy with the Czar's reverses. On the other hand, pretty nearly everybody is astonished at the apparent collapse of the Russian army organization, and we are beginning to imagine a parallel between the French just before Sedan and the Muscovites at Sistova. It is quite possible that there may be a sudden and vital alteration in all this before the present remarks are in all this before the present remarks are in type, but, at all events, unless the invading forces make some decisive display of their strength without delay, they will not only achieve nothing this year but will stand every chance of having to winter north of the Panils. the Danube.

THE TRADE OUTLOOK,

with this miserable war abroad and exceed ingly bad harvest weather at home, does not materially alter. There is no improvement in the iron trade, and but slight signs of any in the fron trade, and but slight signs of any change for the better in the various leading lighter industries. In several parts of the country wages disputes of a more or less serious description are threatened, or are already in existence—in fact, what with the desperate efforts of the trades unions to reorganize themselves, and the strenuous exertions of the employers to secure both lower wages and longer hours, we seem to

IMPENDING STRIKES

of great significance. There was, for in-stance, great excitement in many parts of South Staffordshire last week, and the coliers said they would tear up the lines o allway sooner than submit to the proposal of their employers for longer hours, no per-quisites and less pay. The situation became critical, 32,000 men being affected, but at the last moment an arrangement would appear to have been made under which the men's representatives have agreed to a reduction of sixpence per day for thick coal men and threepence for thin coal men, on the condition that the masters withdraw their demand for the lengthening of hours and the abolition of perquisites. In South Yorkshire and North Derbyshire 30,000 miers are now under notice of a general reduc-ion of wages. They threaten a fierce tion of wages. They threaten a fiere resistance, but there will be a conference resistance, but there will be a conference between the two parties during the present week. At Buckley, near Wrexham, the colliers are now on strike against a 10 per cent. drop. In South Staffordshire the nut cent. drop. In South Statiordshife the flut and bolt makers, who have been on strike some time, have refused the masters' proposal to refer the dispute to arbitration. The Clyde shipbuilders' lockout has been brought to an end provisionally by the reengagement of the men at the old rate of warren producers, definite settlement of the wages, pending a definite settlement of the question by arbitration. The Dundee mill orkers' strike is prolonged, as is the masons strike in London. With reference to the various disputes in the building trade, a largely attended meeting of master builders was held last week in Manchester, there being gentlemen present from London, Bir mingham, Liverpool, Oldham, Wolverhamp ton, Stockport, &c., together with 90 Man-chester firms. The action of the Manchester employers in importing American workmen was approved of, and it was decided to form a national association of master builders. In the Northumberland coal trade the arbitrator, Mr. Herschell, M. P., has just given his award as to the claim by the masters for a drop of 10 per cent on the wages of hard and steam coal miners and 15 per cent, on soft coal workers' wages. Mr. Herschell decides that the employers have failed to prove their case, and he therefore awards in favor of the men. In doing so he makes some interesting remarks on the

COAL TRADE COMPETITION

between the North of England and South Wales. He says, inter alia: "That the Northumberland coal trade is in an unsatisfactory condition I quite believe, notwith-standing that the output last year was greater than ever. That output was obtained from a much larger number of pits working worse seams and shorter time than were worked a few years ago. If the increased production had been obtained from a smaller number of collieries, the pits would

&c., &c., &c.

THE WEEK'S FAILURES

have included a meeting of the creditors of Crabtree Bros., of Kidderminster (whom I alluded to last week) at which the debts were shown to be £40,715, and the assets £24,991. The creditors of B. H. Harris & Co., metal rollers, Birmingham, have also met, the liabilities being stated at £99,732, and the assets £39,185. The creditors of Mason Bros. & Co., of Bradford, have debts aggregating £11,293, the assets being £4,791. At Dewsbury, Joseph Garbutt, woolen manufacturer, has suspended, owing £10 coc. has suspended, owing £10,000.

THE SOUTH DURHAM IRON CO.'S shareholders and creditors will meet this week at Middlesboro, to consider what course is best to pursue in the liquidation. A preliminary circular has been issued, from which I observe that the company's liabilities reach £78,812, with assets of the nominal value of £76,000. The works are set down at 156,000.

£76,000. The works are set down at £56,500, but I doubt there will be some difficulty in realizing. THE WIGAN COAL AND IRON COMPANY

stating that both the output and the sales of coal had decreased, and prices of both coal and iron had continued to fall. There had been a feeble demand for pig iron, and although only four furnaces had been in blast, stocks had gradually increased. THE CONSETT IRON COMPANY, in Cleveland, on the other hand, "shows up" to great advantage. The annual report in Cleveland, on the other hand, "shows up" to great advantage. The annual report showing the year's profit to have been £83,000, out of which a dividend of 15 per cent. will be paid, besides leaving a balance to be carried forward and an addition to the reserve

BOLCKOW, VAUGHAN & CO.

of Middlesborough, are also apparently doing better, as the directors, at their meeting in London, on Thursday, decided to pay interim dividends at the rate of £1. 2/6 per share upon the A shares, and 15/ per share on the B shares, for half year ending June 30.

SCOTCH PIG IRON

has been steady in price during the week, but with rather less business done. Makers' prices are almost stationary. There are now

5000 tons having been so imported last week. Writing from Glasgow August 24th (evening), James Watson & Co. said: There has been very little business doing the last week in warrants, although price remains steady. Transactions have taken place from 55/41/2 to 55/01/2, cash, closing buyers at 55/; selat 55/1 per ton. Shipments last week were 12,096 tons, against 9711 tons in the corre

sponding w	eek o	f 1876.	We	quote:	
				No1.	No. 3
G. M. B., at (Hasgo	W		. 56.0	53
Gartsherrie,	* 6		******		55 6
Coltness,	8.6				55 6
Summerlee,	8.6				54 6
Langloan,	8.6				55 6
Carnbroe,		******			53/6
Calder, at Po	et Du	ndas		6.6	54/
Glengarnock	at A	rdrawan.		60.6	
Eglinton.	4 CEL 28				55
Dalmellingto	m ++				53
	III.			. 50	53/6
Shotts, at Le	шп			01 6	56/
Kinneil, at B	o ness	********		57 6	52 6

Messrs. Wm. Colvin & Co. (Glasgow), also report "a quiet market, with little change in makers' prices."

The quotations of John E. Swan & Bros. prices current August 24th, include: Coltness, Glengarnock, " ... Eglinton, " THE IRON AND STEEL INSTITCTE

things. In the cast steel trade, for instance, I am told of an increased activity here and there, not only on account of the home orders which usually do come in about the harvest serser but also in fulfillment of demands from the United States, Canada, India and two or three continental coun-

There is also a rather better feeling in the cutlery trade, as well as in some branches of electro-plate manufacture. Best kinds of cutlery sell the most freely for Canada, the cutlery sell the most freely for Canada the States and the chief centers of population of this ceuntry. The United States market appears to be reviving, recent advices giving the information that the Southern States are buying more freely of English cutlery than for two or three years past. Other advices from the same quarter express the belief that the fall trade will be much better and stronger than that of the former part of the year. I am told that one Sheffield house, bad as trade has been, has on the average sent about 1000 dozens of spring and other knives to the States every week this year.

The iron market proper has not been quite

The iron market proper has not been quite so strong, probably owing to the fact that the considerable limitation of production in Scotland has not had the effect of causing a cessation of stocking, whence it is naturally inferred that the production is still outside the requirements of the market.

In the rail mills there is hardly so much work in hand, and it is understood that the orders which have hitherto kept the machinery in motion have been pretty well worked through without being replaced by others of corresponding value. It is stated that engineers are now manifesting a decided preference for single headed, in place of double headed rails, it being alleged that the turned metals never being alleged that the turned metals never make a firm, good "road." In this connecmake a firm, good "road." In this connection, it may be said that rail makers are con siderably interested in the newly invented rail fastener, which is now undergoing prac-tical tests on the Midland line, and which is likely to be pushed by local gentlemen who have not only capital but established connections with which to back it. For other rail-way requisites there is a moderate call only, springs being neglected, and the sole feature in the inquiry for axles a good order for India, which has been intrused to John Brown & Co.
From the Leeds locality somewhat more

an increase of 1762 tons in the week—a fact which goes to show that production is still in excess of demand, although there are only 57 furnaces in operation in Scotland. Considerable lots of Middlesboro pig, however, continue to be brought into Scotland, over 5000 tons having been so imported last week with the source of the district is still reported excession. account. There is also a fair inquiry for best boiler plates. The common iron trade of the district is still reported excessively quiet, the works running half time only, and prices being thoroughly unremunerative. In the file and saw trades there is great depres-sion, and no arrows the trades of the control of the consion, and no apparent chance of an early improvement. Some of the collieries are just now doing more in steam coal for export, in order to get as much off as possible prior to the close of the shipping season. Last week's exports from the Humber ports were 32,402 tons, of which 14,049 were from Hull and 14,682 from Grimsby, the balance going from Goole. With London an average house coal trade is being done, the various railways now carrying some 370,000 tons a month into the metropolis from all the coal

At one time I was able to present your readers with statistics of the trade of Shef-field with the United States, but as some of the large local firms are said to have raised objections, the local American consul now declines to furnish the figures, which would be without doubt most interesting.

爱炸药

THE WEEK'S FIRES.

include a couple of such disasters in collic ries. At the Five Quarter's Mine near Bol-ton, belonging to Mr. Scowcroft, the fire broke out in the workings and still rages, although the mine has been flooded with water. Near Wigan, the Mains Colliery of

STAFFORDSHIRE AND BIRMINGHAM

There has been no particular change in the iron trade proper of these districts, but a good deal of satisfaction is felt at the amicable settlement of the local miners' wages, to the extent referred to in another wages, to the extent reterred to in another part of this letter, and it is now presumed that as coal will be, pro rata, declared down 2/per ton, some reduction will be made in the price of iron. Up to the time of writing, however, no such alteration has been notified, and it seems somewhat open to doubt whether the change will be made prior to whether the change will be made prior to the October quarter days. It may, never-theless, have the general effect of weaken-ing the prices of unmarked iron, which is now purely nominal and can be had at almost any quotation on the basis of £5. 12 6 to £6. 10 for (very) ordinary bars. There is still a fair demand for best branded bars is still a fair demand for best branded bars at £9, and a moderate export business in sheets at £7. 10/ to £8 for singles, and £9 to £10. 10/ for doubles. Nail rods are in rather better request at £8. 10/ to £9, and some kinds of plates at £8. 5/ to £9. Sheets for ordinary stamping purposes sell slowly, and are very much "cut" in regard to prices. In some of the hardware branches there is a slight improvement, but the Spanish houses are likely to curtail their there is a slight improvement, but the Spanish houses are likely to curtail their requirements very considerably in face of the new tariff.

SOUTH WALES AND MONMOUTHSHIRE

remain quiet. During last week, 700 tons of rails went from Cardiff to Cronstadt, and 270 tons to Genoa. Besides these 1000 tons went to Christiana, 662 tons to Bahia from Bleenavon Works, as well as small lots of pigs, bars and sheets to Antwerp, Palermo, St. Vincent and Friedrichstadt. The coal shipments last week amounted to 123,903 supments last week amounted to 123,903 tous—a considerable improvement on the preceding week. Many of the collieries, nevertheless, are only working four days weekly. At Rudry, near Machen (Newport), a new tin plate works was opened a few a new tin plate works was opened a few days ago, with a capacity of 1200 to 1500 boxes weekly, the present average price being about 13. There are all the latest mechanical improvements, by the use of which great economy is anticipated. The Upper Forest Tin Plate Works at Morriston, we for sale this week. In convention with Upper Forest 11n Flate works at morrison, are for sale this week. In connection with the steel rail trade of this portion of the principality, it may be stated that the current quotation for those articles are £6 to £6. 10/, f. o. b.

THE METAL MARKETS

have again ruled quiet, and but a small busi-

ness has been done.

Von Dadelszen & North report: "Copper flat and easier. Chili bars, G. O. B., have been sold to a small extent, at £68. 10/ and even £68. 5/, sharp cash. Named brands, £68. 15/ to £69. 10/. Very little doing in £68. 15/ to £69. 10/. Very little doing in Australian. Wallaroo still quoted £80 to £80. 10; Burra, £75 to £75. 10; English tough, £74 to £75; select, £75 to £76; sheets, £80. Tin has been dull and little doing; Straits, £64. 10/ to £65, and Australian £63. 15/ for small spot parcels, and £63. 10/ for larger lots landing and to arrive. The Dutch market flat; Banca, 40fl., and £80 title 2.84 flat; English £68 10/ to £70; rive. The Dutch market flat; Banca, 40fl., and Billiton, 38fl.; English, £68. 10/ to £70; bars, £70. Tin Piates quiet. Lead dull; English pig, £19. 17/6 to £20; soft Spanish, £19. 12/6 to £19. 15/. Spelter.—Nothing reported; £19. 5/ to £19. 10/ for ordinary brands. Quicksilver has fallen to £8. Anti-

Official opening report of the London Official opening report of the London metal exchange this morning: "Copper continues inactive. G. O. B. Chili bars quoted £68. 5/ to £68. 10/; Australian, Wallaroo, £80 to £80. 10'; Burra, £75 to £75. 10/; English tough, £73. 10/ to £75; select, £75. 10/ to £76. 10/; India sheets, £79. Tin is firmer; Straits, £65, rather buyers, and Australian, £64, with small sales; English ingots, £68. 10/ to £70. Scotch Pig Iron easier at 55/, cash. English Pig Lead, £19. 17/6 to £20. 5/; soft Spanish, £19. 12/6 to £19. 15/. Spelter quiet, £19. 2/6 to £19. 10/. Quicksiter, £8. Antimony, £48."

The Mining Journal remarks: Copper.—Australian still keeps the leading position in our market, and the price is maintained with considerable firmness. This arises not so much from an excessive or extraordinary demand as from the strength and capacity of holders, and buyers who are desirous of securing this description of copper have to seek for it, as sellers are not pressing it for sale or displaying the slightest eagerness to realize. Burra and Wallaroo are still the two favorite brands and most in request, and as Burra is so much lower in price than the other brand, it is of course the most advantageous in that respect for a consumer to buy. Chili bars have been slightly declined in value, but the inquiry is very limited at the reduced price, and the general opinion seems to be that the value is not sufficiently low to promote any activity in business English is very quiet, particularly manufac tured, and no improvement is expected for Indian sheets, as the Indian markets have been well supplied and the famine will undoubtedly produce a bad effect. The demand must be materially affected thereby, and prices must consequently suffer. As soon as the present contracts run off smelters may experience great difficulty in procuring fuel orders and in finding sufficient work for their mills. Although India forms but one outlet, yet it is a very large one and the best the smelters have. Even a temporary depri-vation of the demand will be exceedingly inconvenient; but the effects of a famine are not overcome in a day, and a repetition of famine in two successive seasons must prove most destructive to general business articles of any value are likely to be depreciated more than ordinary things of compara-tively small value. The famine in some dis-tricts is so severe as to be described in the telegrams as desperate; and if this is the state of some of the districts, and the whole of the southern part of India is more or less stricken, then it will take at least six months before the trade again reaches its average dimensions. It is truly lamentable to hear of the deplorably starving condition of the people, and we hope that England will

or two instances failures have already occurred among the natives. The goods have been thrown upon the merchants' hands, and as the markets will be dull and declining for some time, it is anything but a promising prospect for them. Unsatisfactory as it may be to be doing little, yet it is very undesirable to increase risks, and these are times when it is far better to do nothing than times when it is far better to do nothing than to accept unsound business, and this is cer-tainly one of these periods. Next to fire, nothing perhaps is more exhaustive than famine, for if the earth fails to yield necesmust forego for a time any further orders for India. Misfortunes seldom come alone, and it is a most unfortunate circumstance and it is a most unfortunate circumstance that the famine should have been added to the list of woes in the year 1877. A cessation of the Indian demand is quite enough in itself, but owing to the war the demand for Turkey and Russia is much interfered with, for few care to execute orders for these countries without receiving a remittance by the same post. In the absence of mill work we would strongly advise rollers on no ac-count to make Indian sheets to stock; they

had much better cease rolling than do so, for it would most certainly result in a loss. Tin. —After the recent drop in value it was only reasonable to expect that a slight reaction would ensue, or at least some effort directed to the partial recovery of previous rates, and this has been attemped, but with very feeble results. On Saturday last £64 was reported to have been paid for Australian, but the buyers soon withdrew, and the market, for want of a little support, soon market, for want of a little support, soon again receded, and sales have been since effected at £63, 10 for spot and arrival, after which £63, 15/ cash was paid for small lots. The arrivals lately have been heavy, and will no doubt produce a depressing effect until the greater portion is sold; but dealers are not inclined to take over much unless reduced prices are accepted, there being nothing in the market to justify the being nothing in the market to justify the expectation of higher prices, consequently they prefer keeping themselves free to operate at a safer period later on. The advices from Australia do not lead importers to look for any better market, otherwise they would not have sold for arrival at the lowest point of the market. The advices from America by the last two mails are very unsatisfactory. The reports state that pig is neglected, and with the continued absence of business the market remains weak, prices being to a great extent nominal; they have been receding for some weeks past, and buyers continue to evince the same indifferent feeling as hitherto. Business is only of a hand-to-mouth character. Banca quoted 18c. Straits and Australian, 15c. Quicksilver.—The demand during the past week has been restricted, and the importers have successively reduced the price to £8. 10/ and £8. The late violent fluctuations have had a disturbing effect upon the trade, but there are signs of an early arrival of activity, the world's consumption continuing on a satisfactory scale, and being quite sufficient to absorb all that can be produced at present low range of value. The last mail advices from San Francisco confirm the reduction of the out-turn brought about by the recent low prices, the receipts during July having been but 5337 flasks, a material falling off from previous months. Stocks do not accumulate, every arrival being speedily purchased to cover the export requirements, which contine as large as ever.

The latest Liverpool prices are: Iron, f. o. b. in Liverpool, per ton. £ s. d. £ s. d.

36	Merchant bar	- 6	IO	o to	6	3.5	0
r	" in Wales	6	0	o to	6	5	0
11	Staffordshire	7	0	o to	Q	15	0
0.	Hoop	7	10	o to	8	10	0
	Sheet	8	15	o to	9	15	0
h	Nail rod	7	0		7	IO	0
1.	Bar, best crown	7	0	010	8	0	0
	Boiler plates	9	0	o to	IO	0	0
). i-	Tin Plates, f. o. b. in Liver	rno	ol.	ner h	or		
8-		£.	8.	d.	£	B.	d.
8-		£.	8.	d.	£	B.	d.
-	Charcoal, I. C	£.	8.	d.	£	B.	d.
	Charcoal, I. C	£.	8. 2 18	d. o to o to	£	B.	d. o
n.	Charcoal, I. C Coke, I. C Copper, delivered in Liver	£.	8. 2 18 01,	d. o to o to per to d.	£ in.	8.	d.
n d	Charcoal, I. C	£.	8. 2 18 01,	d. o to o to per to d.	£ in.	8.	o d.
	Charcoal, I. C	£. por	8. 2 18 01,	d. o to o to per to d.	£ in.	8.	o d.

INDUSTRIAL ITEMS.

West Waterville is celebrated for its edge tools, and about three-fourths of all the scythes produced in New England are said to be manufactured there. Messrs. Emerson, Stevens & Co. of this place have been in the business about seven years, they employ 30 hands, and turn out 3500 dozen scythes and 2000 dozen axes per day.

MASSACHUSETTS.

The Franconia Iron and Steel Company, at Wareham, having filled their large orders, have shut down for repairs. The nail department of the Fall River Iron

Works has been shut down, and it is no definitely known when it will be restarted. NEW YORK.

Recently Meneely & Kimberly have made two separate shipments of church bells to South America, while others have gone to Nova Scotia, Ontario, Texas and several of the States ranging from Maine to Nebraska. The Bessemer steel works and Rensselaer

steel rail mill, Troy, have suspended work for repairs. A month will probably elapse before work will be resumed. The sale of the property and effects of the Oleott Iron Manufacturing Company, which was to have been held on the 6th, has been

postponed to the 21st inst. DELAWARE. The McCullough Iron Company started up heir sheet mill at Wilmington last week. their sheet mill at Wilmington last week

PENNSYLVANIA.

The Baldwin Locomotive Works have just at Louisville.

ing numerous orders from abroad, one being from Australia for 45 machines. Messrs. James E. Packer & Son, of Philadelphia, are the builders of the machine

The Pennsylvania rail mill, Danville, was lit up on Monday the 3rd, and is engaged on an order that will last them about two

No. 3 furnace of the Pennsylvania Iron Works, Danville, which has been running steadily for over a year, blew out on Tuesday the 4th, for want of coal.

The Enterprise Works, Danville, Cruik-shank & Moyer, are busily engaged on a contract for the Sunbury jail, and they have saries for the support of life there is an end to trade. We feel sure that for want of money the consumptive power of the people must become extremely limited. Sellers

The Danville Iron Works and the Co-operative Iron Works, Danville, are also work

ing on full time.

The Union Iron Works of Bloomsburg re purchased at sheriff's sale on the 25th ult. by the Bloomsburg Saving Fund Association, for \$2000.

The sheriff sold yesterday at his office the Moselem Furnace in Richmond township, and the properties belonging thereto, to Leibrand & McDowell, of Philadelphia, for \$200, subject to incumbrances of \$100,000 with interest. The purchasers are a large

stove manufacturing company.

D. B. Fisher has commenced shipping iron

D. B. Fisher has commenced shipping iron ore to Lenhartsville, for the purpose of starting the Windsor Furnace, which Mr. Fisher has purchased.

The large bell and hopper built for the Pottstown Iron Company at the Weimer Machine Works, Lebanon, has been shipped. The top of the hopper is 16 feet in diameter by 5 feet 6 inches high, and weighs upward of eight tons. The bell is 10 feet 6 inches in diameter, and weighs 2½ tons. The beam is 17 feet long and weighs 2½ tons. The beam is 17 feet long and weight

nearly two tons.

The Lawrence Ore Company, at Wampum is shipping about 200 tons of ore per day from

Lebanon Furnace No. 3, which has been undergoing repairs, has been finished, and will be blown in in a few days.

The Thomas Iron Company, of Hokendau-qua, have increased the force of men in their furnaces, and it is thought that the works will be kept in operation throughout the whole winter. At all of their ore mines extensive repairs are being made, that ore may be taken out in large quantities. New engines and pumps have been put up.

The furnace at Kurtztown was blown out September 3. It was in blast for 31 consecutive weeks. The reasons assigned for secutive weeks. The reasons assigned for the suspension are several. First, the insuf-ficient supply of coal; second, that the fur-nace did not give perfect satisfaction. The Hematite Iron Company, of Allentown, was working the furnace.

The Ferndale Rolling Mill was to start up

The Bailey Iron Works, Harrisburgh, are

Wampum Furnace is idle.

PITTSBURGH AND VICINITY.

The erection of the buildings at Idlewood, a suburb of Pittsburgh, for the Jacobus & Nimick Manufacturing Company has been commenced, and are to be finished in November. J. F. Bruggerman, of Allegheny, has the contract, which amounts to \$24,000. The glass firms now operating are Adams

& Co., Atterbury & Co., McKee & Co., Bryce, Walker & Co., Campbell, Jones & Co., and Dithridge & Co. Those preparing to resume operations are Duncan & Son, Doyle & Co. and King, Son & Co. Others are ready to resume as soon as the labor troubles are settled.

Messrs. J. P. Smith, Son & Co. have made

shipment of 12 dozen of their Evening tar Night Lamps to Switzerland. The Soho Furnace of Moorhead & Co. has

been overhauled, in fact rebuilt. A fire has been lighted in the furnace to dry it, and it is expected it will be put into blast by the ist of October. The mills of this company are running full.

Everson, Macrum & Co. have shut down their Pittsburgh mill, and will wait for more

remunerative orders before starting.

The Eames process at the steel works of Anderson & Passavant is giving very gratifying results. An 8-foot furnace is now in rying results. An 8-100t furnace is now in operation, and a 24-foot furnace is to be built. Strong iron has been puddled with 38 gallons of benzin, and "frozen" pots melted in a coke hole in 2 hours and 10 minutes with 17 gallons. The process is to be tried

at some of the iron mills.

Spang, Chalfant & Co. are building

One of the sheet mills at Singer, Nimick is running double turn on saw plates. A good indication that this trade, which was nerly monopolized abroad, is remaining in the country

Lindsay & McCutcheon began to run their oop mill double turn last Monday. Reese, Graff & Woods have added to their Steam street cars are to be introduced in

Pittsburgh.

Chess, Smythe & Co. are running their puddlers double turn.

Last week there were made at the National Tube Works, McKeesport, wrought iron tubes 15 inches in diameter and 30 feet long, for a steamboat now building at Louisville. They are required to stand a pressure of 200 pounds to the square inch, but are put to a test at the works of 600 pounds. ville. The hands accepted the former rate of wages and withdrew their application for an advance.

establishment, for a rolling limit in longer town, Ohio, ten flues 12 inches in diameter and 36 feet long; and not long ago some flues 14 inches in diameter and 30 feet 4 flues 14 inches in diameter and 30 feet

The Badwin Locomotive works and we hope that people, and we hope that people the positive. But hope the positive works are laurent people the positive works are blowing all winter.

S44 Germantews Avenue, Philadelphia to blowing all winter.

The Republic leads the van this season in the matter of shipments, having, as will be sean by our tables, it positive. The Republic leads the van this season in the matter of shipments, having, as will be sean by our tables, it possible, to keep her blowing all winter.

S44 Germantews Avenue, Philadelphia to the most people the trains most effectually by taking the hints and pins and throwing them in the matter of shipments, having all winter.

The Republic leads the van this season in the matter of shipments, it possible, to keep her blowing all winter.

S44 Germantews Avenue, Philadelphia to the work of the matter of shipments, it possible, to keep her blowing all winter.

The Republic leads the van this season in the matter of shipments, it possible, to keep her blowing all winter.

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The Republic leads the van this season in the matter.

The Republic leads the van

inches long were turned out for a steamboat

order of 40 tons of links and 20 of pins was given Wilson, Walker & Co., and the whole order made and shipped in six days. Their link machine takes the hot iron from the rolls, cuts and bends it, and prepares it for welding at the rate of 15 tons per day.

A small vein of iron ore has been discov-red on the farm of Mr. N. W. Shafer, at iellevue. The impression is that it is underlaid with a richer and heavier vein

The United States Iron and Tin Plate ompany are turning out a superior quality of charcoal terne plate. They have also begun the manufacture of fine sheet iron of special grades and sizes. They furnish stove

special grades and sizes. They turns stove pipe iron cut to length for pipe from 4½ to 8 inches in diameter. The experiments at Park Bro. & Co.'s with the Siemens direct process have not been successful commercially. Some changes are being made in the furnace, when they will be resumed.

WEST VIRGINIA

The Riverside Iron Works, Wheeling, are running double turn, employing about 500 men. These works have 126 machines in

eration. The Belmont Nail Works Company, Wheeling, have been idle for some time or ing, nave been idle for some time on account of not being able to procure metal while the river was low. The forge department started last week, and it was thought by the managers that the nail department would go into operation some day this week. These orks give employment to 550 men and boys. The Riverside Furnace is in blast, making

about 500 tons per week.

The La Belle Iron Works have not been running for several weeks. The forge department of this mill is being enlarged, and soon as the work is completed the mill

as soon as the work is completed the minimum will resume operations.

Benwood Iron Works started their forge department week before last, and the factory was put into operation Monday the 3d. This mill has been idle since the 3d of July last. The Benwood Mill is almost new, having been completed in the early part of 1877. ing been completed in the early part of 1877. This mill is one of the best mills in the country and is fire-proof throughout.

The Whitaker Iron Works are running in full, manufacturing sheet iron exclusively. A patent measure and keg factory is also in operation in connection with the mill. There is a passably fair demand for sheet iron, but continue low.

The Norway Tack Factory, of Wheeling, is running five days per week, which is something unusual for these works, as they generally run but four.

OHIO.

The sheriff of Perry county last week sold 6000 acres of land belonging to the Ohio Great Vein Mining Company. The sale was the largest ever made in the county, and the land embraces some of the best mineral property in the world. The sales aggregated in all \$85,688. Mr. A. W. Scott bid in for the Ohio Iron Company, of Zanesville, the Latta tract of 340 acres, the Grigsby tract of 200 acres, and an adjoining tract of 50 acres, in all about 600 acres, for \$31,000. Four years ago the property would have brought \$1,000,000.

The Jefferson rolling mill at Steubenville

was to resume operations on the 10th.

The Bellaire Nail Works are running to their full capacity, employing about 400 men. The mill stopped running in July, and after being idle six weeks, resumed operations on Tuesday last. The managers report the trade very dull and orders low. They have ninety machines running, and turn out 5,000 kegs per week.

The Ætna Iron and Nail Mill, of Bridge

port, is running in full, giving employment to 300 men. This firm consider that the trade looks in no way encouraging, and that prices are exceedingly low. A new train of rolls will be put into operation shortly at this mill.

The channel span of the bridge over the Ohio river, at Cincinnati, built by the Key-stone Bridge Company, of Pittsburgh, for the Cincinnati and Southern Railway Company, has just been swung clear of the false works. This is the largest span—520 feet—of truss bridge in the world. The upper cord is 185 feet above ordinary water, and weighs about ,300 tons.
The Alliance Rolling Mill, at Alliance, wa

sold at the pitiful figure of \$9,200. Mr. Wilcox, of Wilcox, Shinkle & Co., and Mr. Henry King, of Pittsburgh, were the pur-

Alice Furnace, Ironton, blew in on the

Princess, at Ironton, is progressing finely in all its departments. The brick work on the casting house is complete. The iron lining

At Ironton, the forge at the nail mill is in operation; the factory will probably start up next week. The Lawrence Mill is running, and the iron is accumulating. Unless the river rises soon, so as to get off some iron.

the mill will have to stop.

The Motlerwell Iron Works, now located at Lancaster, are discussing the propriety of removing to Portsmouth. They will transfer their entire establishment to Portsmouth if the city will donate them not less than one acre of ground upon which to build, and leave the Southern market. interest. They manufacture cultivators, plows, shovels, iron for jails, cutting box knives, &c.

The Burgess Iron and Steel Works Com-pany are now engaged in putting up new steel works which are to be run entirely by gas, the company purchased the right of a Pittsburgh company who have the process patented. The main building now being put up is 42 by 44 feet, and the building over the gas retort 20 by 25 feet.—Portsmouth Valley Blade.

MICHIGAN The Marquette & Pacific Rolling Mill Furnace, having received a cargo of coke, and having more on the way, commenced blowing again on Thursday morning, after hav-ing been banked up for several weeks. The manager intends, if possible, to keep her

average of production is as large as ever. The season's shipments will exceed 150,000

tons.

The following shows the total shipments of ore from the Lake Superior district for the season up to, and including Wednesday, September 5th, together with those of a cor-

Total Showing an increase of 105.		729,645
From Where. From Marquette. From Escanaba From L'Anse.	245,000	1877. 397.527 274.299 57.819

Mining Journal. ILLINOIS

The annual meeting of the stockholders of the Springfield Iron Co. was held at the company's office a few days ago. The fol-lowing gentlemen were elected to serve as lowing gentlemen were elected to serve as directors for the ensuing year. John W. Bunn, Orlin H. Miner, John Williams. J. Taylor Smith. George M. Brinkerhoff, William D. Richardson, Charles Ridgely. The new board re-elected the old officers, viz: Charles Ridgely, president; John W. Bunn, vice-president; George M. Brinkerhoff, secretary. It appeared from the directors' report, which was submitted to the meeting, that the make of rails (all iron) in tons of 2.240 pounds for the fiscal year which noded that the make of rails (all iron) in tons of 2,240 pounds, for the fiscal year which ended with July 31 last was as follows, as compared with previous years:

				2							Tons.
r	ending	July	31,	1873,	rails	made					. 10,561
	0.5	July	28.	1874.	60	6.6					.13,668
	6.6	July	28	1875.	4.5						.24,240
		July			6.5						.21.787
				1877,	6.6						.26,365

This is the largest production yet reached by the company, although not up to the full capacity of the works, as will appear from the fact that 3350 tons of rails were made in a single month during the year.

KENTUCKY.

At Louisville, the Lithgow Manufacturing ompany report business in stoves and man tels as lively

T. P. Barclay, of the Kentucky Bell Factory, Louisville, is working full force, has a large stock on hand, and reports orders coming in fast.

The Tennessee Iron and Steel Company, Chattanooga, are adding 30 feet to accommodate rail, fish plate, punch, merchant shears and other small machinery.

The Chattanooga Commercial says: "Mr.

C. B. Isbester, of the firm of D. Giles & Co. arrived here last week and is busily engaged preparing to start the works, which they hope to do this week. Several carloe's of machinery have arrived, and the engine and boiler are set up and are nearly ready to fire up. They will erect a large pattern shop as soon as the foundry appurtenances are finished and running smoothly. The Kingston Steel Works, at Chatta-

looga, are about to start up again.

The Roane Iron Company, of Chattanooga, have definitely decided to build at once steel works in connection with their other plant at that place.

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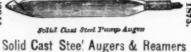
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Length of arms 20½ Length of sweep for work 17 Height of table above floor 31 Diameter of table 6 Length of stroke 1½ Diameter of driving wheel 12 Diameter of balance wheel 6% Diameter of emery wheel 45	66 66 66 66 66
Number of strokes of saw per minute	000

Weight of Scroll Saw, 30 lbs.

Lamson & Goodnow Mfg. Co., Table	THE LATHE.
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Length of saw arbor..... 21/4 Height from floor to table33 Size of table.....

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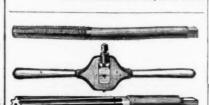
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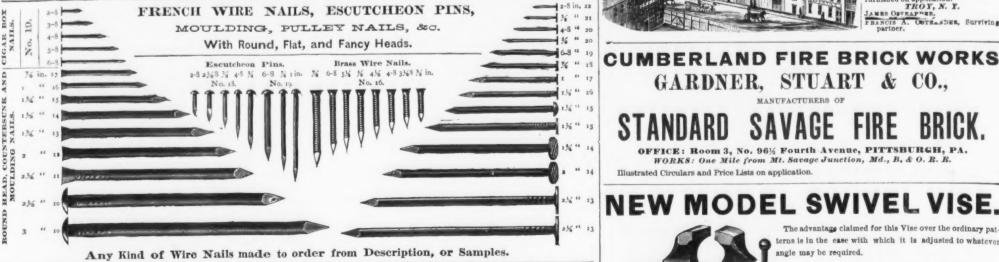
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Name and Address of Exhibitor: Eben Moody Boynton, New York.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz:

Report: "Being of very Superior Quality and of great Practical Utility." Baniel States Centennial Commission for award, for the following reasons, viz:

Signature of the Judge.

J. D. IMBODEN, of Virginia, CHARLES STAPLES, of Maine, G. L. REED, of Penn.

J. D. IMBODEN, of Virginia,
J. DIFENBACH, of Germany,
A true copy of the record.
Given by authority of the U. S. Centennial Commission.

J. L. CAMPBELL, Sec'y.

CHARLES STAPLES, of Maine,
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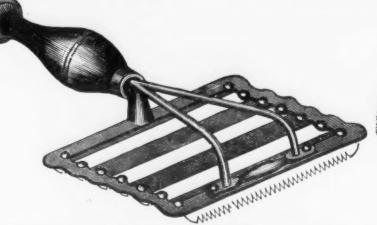
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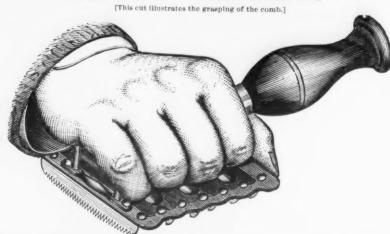
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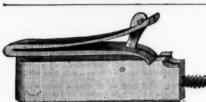
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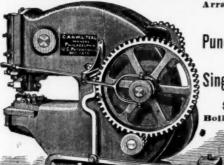
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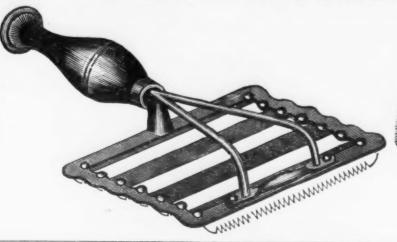
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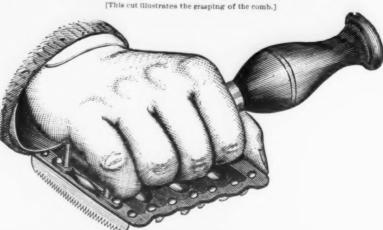
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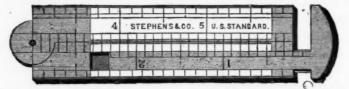
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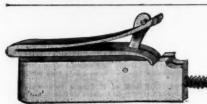
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Em vista do rapido acsenvolvimento que se tem operado no
commercio de exportação dos Estados Unidos quanto a Machinas,
Ferramentas, Artigos de uso caseiro e Utunslios metallicos, chamamos, a attenção do commercio dos paizes estrangeiros para a

RON AGE, certos de que o conhecimento desta Revista será de
grande beneficio practico para todos os que e e acham interessado

no commercio de generos americanos, suas machinas, systhema
de manufactura, etc. Cada numero da IRON AGE, atém dos
assimptos de sua especialidade, conterú mais de 800 annuncios
das mais importantes fabricas dos Estadoz Unidos, onde todos os
interessados em manufacturas e ferramentas, encontrarão amplas
informações a respeito de quaesquer mercadorias que se prestem
à introducção em paizes estrangeiros, assim como endereços dos
verdadeiros fabricantes americanos.

A fama que as machinas e ferramentas americanas teem obtido
no mundo inteiro é devido a sua burateza e superioridade, pelo
que são dignas de menção. A condição deste paiz, de alguns annos
a esta parte, tem attrabido muita attenção dos negociantes e importadores assim como dos exportadores e fabricantes, cujas
vistas começam as evoltar para mercados estraugeiros onde mais
se manifestam as probabilidades de um consumo crescente, o que
so messan tempo fas com que euvidem seus esforços afim de supprir essas lacunas vantajosamente e por meio de um reduzido
preço sobrepujar qualquer competição. Grandes facturas comecam as er exportadas para todos os paizes evilizaçõe do mundo,
especialmente para a inglaterra e suas colonias, para s Russia,
America do Sul e Antilhas, assim como pras a
mór parte dos mercados até agora provisios pela inglaterra e
sucos paixes d'Europa.

As machinas e artigos metallicos deste paiz estão, portanto,
sendo introduzidos em grande secala em toda a parte do mundo

ou cos pasizes d'Europa.

As machinas e artigos metallicos deste paix estão, portanto, sendo introduzidos em grande escala em foda a parte do mundo com vantagens e lucros para os seus importadores.

A IRON AGE é a unica Revista publicada nestes Estados Unidos com o fim de servir de fonte de imformações aos 87s, Negociantes de Ferragens e instrumentos de metal, e como tal considera-se o unico representante desse ramo d'industria. No numero de seus assignantes a IRON AGE conta muitos negociantes do Canadá, Inglaterra, Irlanda, Escossis, Galles, França, Hennanhs, Belgica, Sui-sa, Austria, Suecia. Noruega, Russia. Antilhas, Vermuda, Brazil. Maxico, Chile, Buenos-Ayres, Ilhas do Facifico, Australia, Nova Zelandia e Galles do Sul.

Brazil. Mexico, Chile, Buenos-Ayres, Ilhas do Facifico, Australia, Nova Zelandia e Galles do Sul.

Certos de que o numero d'assignantes da IRON AGE, com um simples abono de um exemplar-specimen, attingirá dentre em pouco a um algarismo avultadissimo, nesoutros tentaremos fazer chegar ao conhecimento de todos canegociantes de ferragens, esta publicação, posto que o seu numero já seja bem respeitavel—e do nilhares de importadoras entre elles. Desejosos, porém, de que se augmente o numero de leitores, no estrangeiro, regamos a todos que pela industria se interessam, que nos enviem um ou mais endereços de amigos, cujos interessas tomem a petro, para que possamos caviar-thes um exemplar desta Revista. Outrosim que nos enviem un compensa fivormações concernentes a este ramo de industria por cujo serviço offerecemos recompensa liberal.

Como todos os annuncios terão de ser incertados nas trez edições da Revista, as pessoas que quizerem obter a folha só com o

ções da Revista, as possoas que quizerem obter s folha só com o fim de saber dos endereços dos exportadores e fabricantes, a edição mensal sahir-lhes-ha mais economica e adaptada ao fim. Remetteremos gratuitamente a qualquer parte do mundo um ex-

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Endereço: DAVID WHLLIAMS 83 Reade St., New York, U. S. A.

A Review of the American Hardware, Iron and Metal Trades.

Published every Thursday, by DAVID WILLIAMS, at No. 83 Reade St., cor. Church New York

PHILADELPHIA OFFICE, No. 220 South Fourth Street. THOS. HOBSON, Manager.

WESTERN OFFICE. No. 77 Fourth Avenue, Pittsburgh, Pa. JOS. D. WEEKS, Manager and Associate Edito

BRITISH AGENCY,

The publishers of The Ironmonger, 44a Cannon Street, London, England, will receive orders for subscriptions and advertise ents on our regular terms.

AUSTRALIAN AGENCY.

The American Hardware Company are our agents for Australia. They have on exhibition at their office at Sidney, N. S. W., files of *The Iron Age*. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

The circulation of The Iron Age is more than double that of any other journal of its class in the world. Established in 1855 under the name of The Hardware Man's Newspaper, changed in 1859 to The Iron Age, it is the oldest publication of its class in the world. The next in age is the Ironnonger of London, established in 1859. Until 1870 The Iron Age was the only publication of its class in the United States.

The largest newspaper in the world is The Iron Age, each number of which is much larger than the London Times, and contains over 25 per cent. more matter than a copy of Harper's Magazine.

In the field which The Iron Age occupied twenty-two years ago it has been steadily growing in favor from year to year, and is to-day practically without competition. The same energy, liberality and skill that have placed it in the front rank of trade journalism will in the future be employed more freely than ever to maintain and advance the high position it has gained.

N VIEW of the rapid development of the export trade of the United States in Machinery, Tools, Hardware, House Furnishing Goods, and other manufactures of Metals, we invite the attention of the trade in foreign countries to The Iron Age, believing it will be found of immediate practical value to all who are interested in American products, machinery or methods of manufacture. Each issue, in addition to its other valuable features, contains more than 500 advertisements of the leading manufacturers and merchants in the United States; and no person engaged in any branch of the Metal Trades in any part of the world can fail to find notices of new articles which can be successfully introduced into his trade, as well as the names and addresses of makers of almost every article of American Hardware.

The reputation for superior quality of American Hardware, Machinery and Tools is world-wide; and the condition of trade in this country for the past few years has forced manufacturers to seek a foreign outlet for their goods, at the same time that it has enabled them to cheapen their products to a point which admits of exportation to many markets at prices to compete with articles of foreign manufacture. Large quantities are now sent to almost all civilized countries of the world, and especially to England and her colonies, Russia, Central and South America, the West Indies, and to nearly all markets heretofore consuming the manufactured products of Great Britain and the continent.

American manufacturers are therefore making greater efforts at this time than ever before to introduce their products into foreign countries, and they will be found ready to offer inducements to responsible foreign houses desiring to handle their goods.

The Iron Age is the only acknowledged representative of the Hardware. Iron and Metal trades of America, nearly every member of which is a subscriber to it. Its foreign circulation already includes regular subscribers in Canada, England, Ireland, Scotland, Wales, France, Germany, Belgium, Switzerland, Austria, Sweden, Norway, Russia, West Indies, Bermuda, Brazil, Mexico, Chili, Buenos Ayres, Sandwich Islands, Australia, New Zealand and New South Wales.

Believing that a very large increase in our foreign circulation will be secured by merely placing copies of The Iron Age in the hands of those who need it, we have taken measures to bring it to the personal notice of all who represent the Hardware, Iron and Metal trades of every country in the world. Our list for mailing sample copies already comprises several thousand names in all parts of the globe, and we are still taking measures largely to extend it. We will, therefore, be under great obligations to anyone in this or any other country who will furnish us with one or more names of foreign manufacturers or dealers in Metal goods. We would also like particulars concerning foreign directories. Any information that will lead to the extension or improvement of our lists will be liberally paid for.

As all the regular advertisements appear in the three editions, persons who desire the paper chiefly as a means of learning the names and addresses of American manufacturers will find the Monthly answer their purpose at a very slight expense.

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The Iron Age

Revue de la Quincaillerie, de la Ferronnerie et du Commerce des Métaux en Amérique.

Publié tous les Jeudis par DAVID WILLIAMS.

au No. 83 Reade St., New York En vue du développement rapide aux Etats-Unis du comme d'exportation de Machines, Outils, Quincaillerie, Ustensiles ménage et autres objets métalliques, nous appelons l'attent des gens du métier à l'étranger sur notre publication "TIRON AGE," dans la certitude que tous ceux qui s'intéress aux produits de l'industrie américaine, à ses machines et à procédés de fabrication, la trouveront d'une valeur immédiate pratique.

Pratique.
Chaque exemplaire, en outre de ses autres points importants.
contient plus de 500 annonces des principaux fabricants des Etats

Unis.

C'est pourquoi, nulle personne eugagée dans une branche quelconque du commerce des métaux, dans quelque partie du monde
que ce soit, ne peut manquer de trouver des annonces d'articles
nouveaux qu'elle peut introduire avec succès dans son commerce,
sinsi que le nom et l'adresse des fabricants de presque tous les
articles de Ferronnerie américaine.

La réputation de supériorité des Américains pour la Quincaillerie, les Machines et les Outils est universeile, et la condition des
affaires dans ce pays-ci pendant ces dernières années a forcé les
fabricants à chercher à l'étranger un écoulement pour leurs produits, tout en les mettant à même de baisser leurs prix de manière
à permettre l'importation de leurs produits dans beaucoup de
localités et de faire concurrence aux articles de fabrication étrangère.

gère.
On en expédie maintenant de grandes quantités dans presque tous les pays civilisés du monde et surtout en Angleterre et dans ses colonies, en Russie, dans l'Amérique Centrale et dans celle du Sud, aux Antilles et sur presque tous les marchés, qui jusqu'à présent ont consommé les produits des fabriques de la Grænde-Bretagne et du Continent.

Aussi les fabricants américains font-ils maintenant de plus grands efforts que jamais pour infroduire leurs produits fabriqués à l'étranger et on les trouvera prêts à offrir des conditions avantageuses aux maisons étrangères responsables, qui désireraient placer leurs marchandises.

a l'etrauger et on les trouvers prets a offrir des conditions avantageuses aux maisons étrangères responsables, qui désireraient placer leurs marchandises.

"THE IRON AGE" est le seul représentant accrédité du Commerce de la Quincaillerie, de la Ferronnerie et des Métaux en
Amérique, et il compte parmi ses abonnés presque la totalité des
personnes qui y sont engagées. Quant à la circulation à l'étranger, il a des abonnés réguliers au Canada, en Angleterre, en Irlande, en Ecosse, dans la principauté de Galles, en France, en
Allemagne, en Belgique, en Suisse, en Autriche, en Suède, en Norvège, en Russie, aux Antilles, aux lles Bermudes, au Brésil, au
Mexíque, au Chili, à Buenos-Ayres, aux lles Bermudes, en Australie,
dans la Nouvelle Zélande et dans la Nouvelle Galles du Sud.
Croyant que pour accroître de beaucoup notre circulation, il
suffira de placer "THE IRON AGE" entre les mains de ceux qui
en ont besoin, nous avons pris nos meaures pour le mettre à la
portée de tous ceux qui représentent le Commerce de Quincaillerie,
de Ferronnerie et des Métaux dans tous les pays du monde.

Toutes les annonces régulières parsissant dans chacune des trois
éditions. les personnes qui ne désirent le journal que pour savoir
le nom et l'adresse des fabricanis, trouverout leur affaire dans
l'édition mensuelle et à très peu de frais.

Des spécimens de notre journal seront envoyés, franco, et avec
plaisir dans toutes les parties du monde.

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S'adresser à DAVID WILLEANS

S'adresser à DAVID WILLIAMS, 83 Reade St., New York, U. S. A.

The Iron Age Revista de ferreteria americana y de las industrias ferreas y de metales. Se publica todos los Jueves por DAVID WILLIAMS

en Reade Street No. 83, Nueva York.

Se publica todos los Jueves por DAVID WILLIAMS
en Reade Street No. 8, Nueva York.

En vista del rápido desarrollo del comercio de exportacion de los Estados Unidos en Maquinaria, Instrumentos. Ferreteria, Efectos para las casas, y otras manufacturas de metales, llamamos la atencion del comercio en los países extranjeros hácia el periódico THE IRON AGE, creyendo que todos los que se interesanos, lo hallarán de un valor práctico è inmedisto. "Cada número ademas de otras materias valiosas, contiene mas de 500 anuncios de los principales fabricantes y comerciantes de los Estados Unides; y ninguna persona que se ocupe de algun ramo de las Ind us trias de metales, en cualquiera parte del mundo, dejará de hallar neticias de nuevos artículos que penden introduciras con érito en su comercio, asi como el nombre y direccion de los fabricantes de casi todos los artículos de Ferreteria Americana.

La reputación de la calidad superior de la Ferreteria Americana, Maquinaria é instrumentos, es universal; y el estado del tráfico erete país en los últimos años ha obligado à los fabricantes á busca, una salida en el extranjero para sus efectos, al mismo tiempo que les ha facilitado aberatar sus productos hasta un-punto que permite su exportacion á muchos mercados à precios que complien con los artículos de manufactura extranjera. En la actualidad se envian grandes cantidades à casi todos los países civilizados del mundo, y especialmente à Inglaterra y sus colonias, Rusa, América Gentral y Meridional, las Antilias, y à casi todos los mercados que hasta ahors consumian los productos manufacturados por la Gran Brefaña y el Continente.

Los fabricantes americanos, por le tanto, hacen en la actualidad mas grandes esfuerzos que nunca para introducir sus productos en los países extranjeros, y se hallan dispuestos ó ofrecer alicientes las casas extranjeras, y se hallan dispuestos ó ofrecer alicientes flas casas extranjeros, y se hallan dispuestos ó ofrecer alicientes flas casas extranjeros, y se hallan dispuestos ó ofrecer alicientes fla

Creyendo que na aumento en nuestra circulación en el exterior podria obteneras poniendo simplemente ejemplarea del periódico THE IRON AGE en manos de los que lo necesitan, hemos tomado las medidas convenientes para hacer que lisque al conponiento personal de todos los que representan la Ferreteria é-fifidustrias ferreas y de metales en todo; los países del mundo. Nuestra lista de ejemplarea demuestra para en hodas partes del globo, y aun tomamos medidas para acrecentarla. Por lo tanto quedaremos muy agradecidos á todo el que en este ó en otro país nos suministro uno 6 mas nombres de fabricantes extranjeros o comerciantes en mercancias de metal. Tambien desariamos particularea concernientes à los directorios extranjeros. Cualquier informe que pueda tender á la extension ó mejora de nuestras listas, sera pagado liberalmente.

liberalmente.

Como lodos los anuncios regulares aparecen en las tres ediciones, las personas que solo dessen el periódico como medio de conocer los nombres y direccion de fabricantes americanos, verán que la edicion mensual llens ese objeto con muy poce costo.

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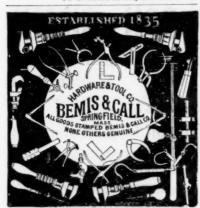
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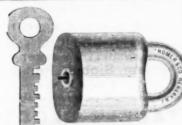
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Yours, truly,
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Or ISAAC COLLINS, Secretary. uld use it for burning the fine siftings or dust from e slack; and those you have since creeted have fully nitrined me in that opinion, for not only do we now use e siftings we could not previously burn at all, but the neration of steam is so rapid that we have discon-unctusing one of the botters, finding we can obtain the aid of your Machine, quite as much steam from

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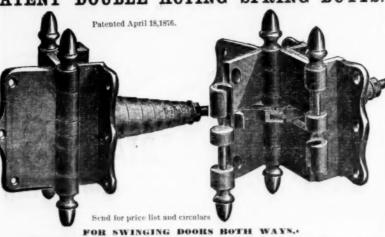
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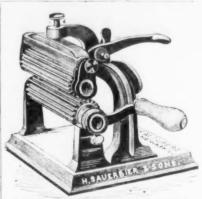
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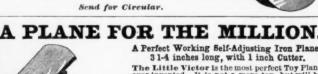
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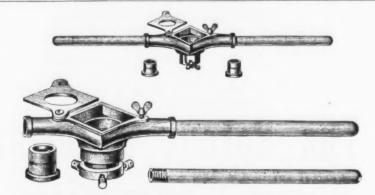
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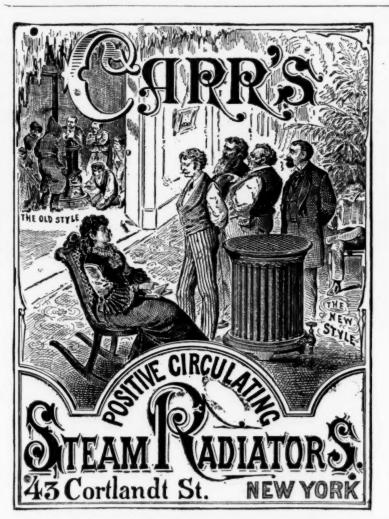


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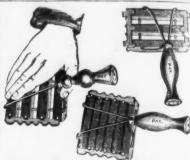
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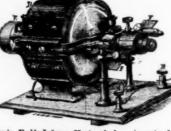
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wintenesa Bros., 517 W. 15th, N. Y. 4 Furnaces. Makers, 77 Richmond & Potts, 198. Fourth, Phila., Pa. 5 Gaivan lized Iren. Leflerts Marshall Jr., 90 Beekman, N. Y. 4 Glans Signa.	Metal Roofing. Brass Goods Mfg. Co., 280 Pearl N. Y
Glass Signs. Otto Steltz, N. Y. G'ass Letter Co., 611 B'way, N. Y. 38 Geverners. Junius Judson & Son. Rochester, N. Y	The Chester Mica and Porcelain Co., 87 Liberty, N. Y. 3 Miners' Candles. Maker of James Boyd's Sons. 10 and 12 Franklin, N. Y
Grindstones. Wood Walter R., 283 and 285 Front, N. Y	Lennox & Paine, Cleveland, O
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Corbin P. & F. New Britsio. Conn. Cowles Hardware Co., Unlow Ville, Ct. Enterprise Mig. Co., Philm. Miller & Fails Mig. Co., Philm. Miller & Fails Mig. Co., 4 Chem ters. N. Y. Cok Hill Mig. Co., Oak Hill, N. Y. Pece G. Buffalo, N. Y. Pece G. Webster, 110 Chambers, N. Y. Pers G. Webster, 110 Chambers, N. Y. Pers G. Webster, 110 Chambers, N. Y. Pers G. Gaff Mig. Co., Cincinnata, O. Providence Tool Co., Cincinnata, O. Russell & Erwin Mig. Co., New York Union Mig. Co. 99 Chambers, N. Y. Van Wagoner & Williams R2 Beekman, N. Y. Wilson Mig. Co. 99 Chambers, N. Y. Wilson Mig. Co. 90 Chambers, N. Y. Wilson Mig. Co. New London, Coan.	Paints and Oils, Dealers m. Devoe F. W. & Co., 117 Fulton, N. Y. Pans. (Dripping and Bread.) Lewis, Dalzell & Co., Pittshnych, Pa. 3
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Hesting Engines. Makers or 18	Pipe, Water and Gas, Makers of. McNeal & Archer, Burlington, N. J. 6 Wood R. D. & Co., 400 Chesnut, Phila. 30 Plane Trons, Manufacture of
Ausable Horse Nail Co. 25 Chambers, N. Y	Di Manufactumen of
Ausable Horse Nail Co. 35 Chambers, N. Y. 8 Globe Nail Co., Boston, Mass. 5 National Horse Nail Co., Vergennes, Vt. 25 Northwestern Horse Nail Co., Chicago, Ill. 6 Platt & Co., Buffalo, N. Y. 5 Putnam S. S. & Co. Neponset, Mass. 8 The Fowler Nail Co., Seymour, Conn. 6	D. R. Berton Tool Co., Rochester, N. Y
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Wallace Win, H. & Co., Albany and Washington streets, N. Y. Warner A. B. & Sons, 28 and 29 West, N. Y. Williamson James & Co., 69 Wall, N. Y. Williamson James & Co., 69 Wall, N. Y. Witney A. R. & Bro., 58 Hudson N. Y. 19 Washington, N. Y. Marangaran, 19 Williamson, N. Y. Marangaran, 19 Boston Rolling Mills, If Cliff, N. Y. M. & Burden Iron Co., 17 Cliff, N. Y. M. & Burden Iron Co., 17 Cliff, N. Y. San, C. & Co., 18 Washington, O. & Co., 18 Washington, N. W. & Oxford Iron Co., 81 Washington, N. Y. & Oxford Iron Co., 81 Washington, N. Y. & Phenix Iron Co., 81 Washington, N. Y.	Townsend w.P. & Co., Pittsburgh, Fa. 12 Road Rollers. Pioneer Iron Works, 149 William, Brooklyn, N. Y. 41 Road Scrapers. & Co. Semple & Birge Mfg. Co., St. Louis, Mo. 26 Rolling Mill Machinery, etc., Manufacturers of. Moore cames, Cor 16th and Buttonwood, Phila. 43
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Iron Pipe. (Tin Lined.) Tatham & Bros., & Beekman, N. Y	Duston Henry & Sons, Phila

HE IRON AGE	1.
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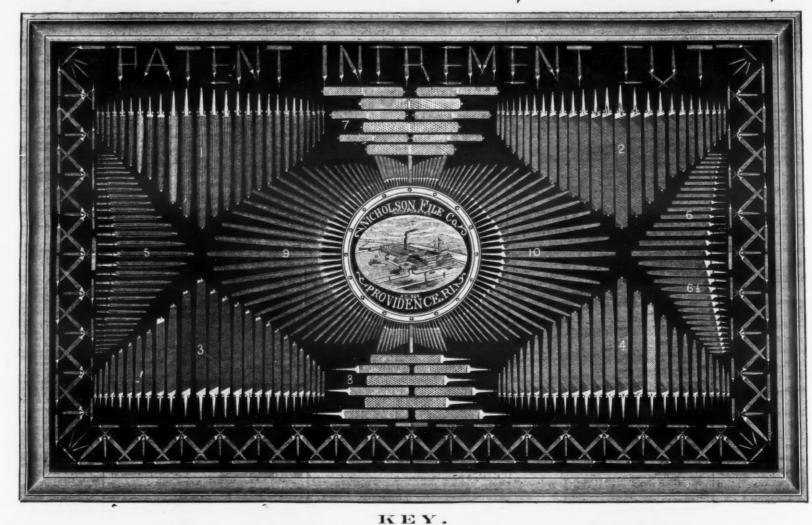
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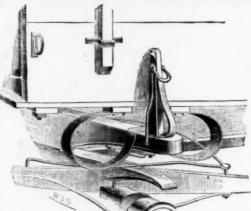
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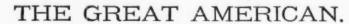
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The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

your Saw to suit the strength of the parties working it.

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In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use,

THE CLIMAX. The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner

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It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.

DISSTON'S CLIMAX

CROSS CUT

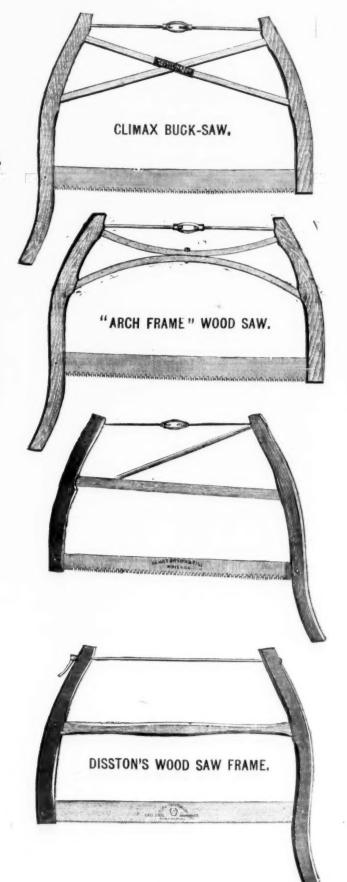
THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.

some sections, and for sawing soft lumber, it is preferred to any other Saw.

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HARDWARE.	1
Anvils. American Wright's. V B gold to be; over 250 Bs 11c, gold Armitage's Mouse Hole Wilkinson's. E B gold to 6 to be; Wilkinson's. F B gold it c	I
Armitage's Mouse Hole gold to @ 104cc Wilkinson's & B gold 11c Eagle Anytis (American) & B 5c dis 20 %	1
Apple Parers. Bay State Parer, Corer and Slicer 9 doz \$12.00 net Improved Turn Table 6 doz 7.50 net	I
Faultless Turn Table 7 doz 7,50 net New Lightuing 7 doz 5,50 net "Old Reliable" 7 doz 6,00 net	51
Eagle Anvils (American). P to ge uis 20 % Apple Parers. Bay State Parer, Corer and Slicer. P doz \$12.00 net Improved Turn Table. P doz 7,50 net Faultless Turn Table. P doz 7,50 net New Lightning. P doz 6,00 net Climax Corer and Slicer. P doz 6,00 net Lightning Fenc. P doz 12.00 net Lightning Fenc. Bits. Conn. Valley Mfg. Co. Douglass Mfg. Co.	1
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Vee' Jennings Bits	PE 07.07
Hollow Augers, Ives'. dis 40 % French, Swift & Co. dis 40 % Bonney's Adjust., & doz \$48—dis 25&10 %	I
" Stearns' Adjust., % doz \$48—dls 25&10 % " Ives' Expansiveeach \$4.50—dls 40 % " Univ'sal Expansive, each \$4.50—dls 10 %	
Gimlet Bits—Screw, \$7.50; no screw, \$9	E
Hartwell's dis 50&10 5	C
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Morse's Bit Stock Drill, list of Jan. 1, 70. 418 35; L'Hommedieu's Ship Augers. 418 15; Watrous Ship Augers. 418 15; Watrous Ship Augers. 52. 4 Muls, Sewing, Common. 79 gross \$1.35-418 25; Sewing, Best. 79 gross 1.55-418 15; Shouldered Peg. 79 gross 2.25-418 15; Patent Peg. 79 gross 2.25-418 15; Shouldered Brad. 79 gross 22.75-418 25% 15; Shouldered Brad. 79 gross 25.75-418 25% 15; Shouldered Brad. 70 gross 25.75-4	E
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Brad Sets, Alken's	HHS
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Axle Grease.—Frazer's	J
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Belle	
" Globe (Cone's Patent). dis 20% 10 % Gong, Abbe's. dis 20% 10 % " Yankee dis 35% 10 %	
" Yankee dis 35ce10 % " Barton's dis 40&2 % Crank, Taylor's dis 25&10 % " Brook's dis 50 %	Т
Crank, Taylor's dis açtio	
" Japanued Leverdis 25&10 %	b
Pull, Brook's dis 50 % 10 % 10 % 10 % 10 % 10 % 10 % 10 %	
Cow, Common Wrought dis 20&10 % "Western dis 20&10 % " Sargent's dis 60&10 %	В
Kentucky "Star". dis 20&10 \$ "Sargent's dis 60&10 \$ "Dodge's Genuine Kentucky, new list-	S
"Hart, Bliven & Mead Mfg. Co. dis 50&to 5 Pull, ""dis 50&to 5 Pull, ""dis 50&to 6 dis 50&to 7 Pull, ""dis 50&to 6 dis 50&to 6	FT
" Texas. dis 40 % Bellows, Common. dis 20 @ 25 % Blacksmiths', Common. dis 20 @ 25 % Extra and Pittsburgh Pattern. dis 20 % Moulders'. dis 25 %	BCE
Moulders'. dis 25 % Hand Bellows. dis 25 % Hand Bellows. dis 25 %	B
Moulders	ECD
" old pattern.	B
Security Blind Fast. Fgross \$14.00, dis 10 & - % Blind Staples. Boardman's Patent, 1/2 in. and larger # B 40c. dis 10&5 % Blocks. # B 40c. dis 10&5 %	I
Blocks. Differential Pulley Blocks. Differential Pulley Blocks. Differential Pulley Blocks.	ACP.
Blocks. dis 20 % Differential Pulley Blocks. dis 20 % Tackie, Rope and Iron Strapped, Providence Tool Co.'s list. dis 30% to % Stanley Kule and Level Co. dis 25% to %	C F H
Blowers. Keystone Portable Forge Co	HR
Cast Iron Chain dis 60&10&10 % Wrought Iron Barrel dis 50, 10&10 % " Square dis 50, 10&10 %	NS
"Shutter (Stanley's list)dis 50 50 60 ft of 10 ft o	В
Carriage and Tire, Common dis 75&3 cash Norway Iron dis 75 Old list dis 6 c	LLA
" Philadelphia. dis 60&10 % " Colema. dis 60&10 @ 60&20 % " Shelton's (old list) dis 6.8 k %	м
Star (Phila)	ANN
" R. B. & W	R
Piow, R. B. & W	C
Boring Machines. Upright. Angular. Hovey's, no Augers. \$100 \$400 net with Augers. 500 600 net	E
Parr's, no Augers	B
Sweets 3.25 4.00 net 5.00 6.00 net 5.00 foo net 6.25 dis 25 %	G J G
Phillips' with Augers 10.00 dis 25 % Bow Pins. Union Nut Co	
Humason, Beckley & Co.'s dis 60 \$ Sargent & Co.'s \$19.70 and \$21.40, dis 60&10 \$ Recover — Barber's Patent	
O. S. Backus	P
Noble's Patent	S
Brackets,—Shelf dis 6o&10 @ -&10 5 Bright Wire Goods dis 6o&10 5 Bull Rings,—Union Nut Co. dis co&20 5	P
Sargent's Gis 65-26 to 5 Hotchkiss' Low list dis 10 5 Humason, Beckley & Co.'s Gis 65 5	B
Butchers' Cleavers. Humason & Beckley Mfg. Co. dis 20 5	H
Risk	NBAW
\$16.50 10.00 21.50 24.00 27.00 30.00 33.50 36.50 Hart Mfg. Co	B
\$20,00 26,00 29,50 33,00 37,00 41,50 44,00 Builing Wrought Brass	B
Cast Brass	R
Fast Joint, Narrow dis co 5 Broad dis 60 5 Loose Joint, Narrow and Broad dis 65 5 Farliament Butts and Mayer's Hinges dis 6 5 7 1 1 1 1 1 1 1 1 1	
Loose Pin Japanned dis – 2 Loose Pin Jap'd, Plated Tips dis – 2	WA
Fast Joint	D
	X
Loose Pin, no Acorn dis 65 g 2 g 4 corns dis 65 g 2 g 5 corns dis 62 g 5 corns dis 65 g 5 corns dis 64 g 5 corns	SK G
Union Mfg. Co.'s Fancy Butts— Figured Enameled Loose Jointdis 65&19 %	11

v York Whole	S
Boston Finish, Plain	Ke Sa
Fast Joint, Narrow dis 40&10 2	GI Ti
Am. Spiral Spring Butt Co., Japanned. dis 25 g "Ency. dis 10 g Sabin Mg. Co., Double Acting. dis 15 g Union Spring Hinge Co. dis 25 g Mfg. Co. Spring Hinges dis 25 g Blind Butts. Parker. dis 70 g	St Fr W
Palmer dls ook of \$\frac{2}{8}\$ Seymour dls ook of \$\frac{2}{8}\$ Seymour dls ook of \$\frac{2}{8}\$ Shepard dls 60 \$\frac{2}{8}\$ Shepard dls 60 \$\frac{2}{8}\$ Luli & Porter dls 60 \$\frac{2}{8}\$ Nicholson dls 45 \$\frac{2}{8}\$ to \$	AI AI C. He
	HI Jo Mi Jo J.
Lyman's	St Bu W Fi Mc
Sardine Scissors — (**q 0.2** gr.o., dis 4.0** dec. 5 star	H. Li Be Re
Nos. 2, 4, 4\(\) 6, 8, 10.	Ki Ki Pe
Cotton .dis ro&to % Wool .dis 19&to % Curpet Stretchers	Es
Casters	Cr De Ge Co
Chain. Chain. Frace, 5\\(\frac{1}{2}\cdot\)-10-2. by the cask, \(\psi\) pair, gold, 50 \(\psi\) 50 \(\psi\) 50 \(\psi\) "7-10-2. by the cask, \(\psi\) pair, gold 55 \(\psi\) 570 German Halter Chain. dis 30\(\psi\) 5 \(\psi\) gold "Coll dis 30\(\psi\) 5 \(\psi\) 50 \(\psi\) Galvanized Pump Chain. \(\psi\) 60 \(Hi Pi
white.	Bu
D. R. Barton Tool Co. (all Rinds). Socket Framing, Crossman. dis 668-5&to 8 Buck Bros. new list, dis 1/5 (2 20 % Hart Mfg. Co., No. 1dis 668-5&to 8 Merrill	Na Na "I
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Dippers. P doz \$3.75 @ \$4.25, net	Huse
Door Springs	Hu Sir Sir Sir
iem (Coil)— No. 1, Large, Japanned	Co
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djustable Handle	Un S C I M. S E
" Hotchkiss dis 10 5" " Wilson's dis 10 5 " Miller's Falls each \$2.50, dis 25 5 atchet, Merrill's dis 25 5 " Ingersoll's (old list) dis 25 5	En S
Moore's Triple Action. dis 20 62 25 % Vilson's Drill Stocks. dis 10 % utomatic Boring Tools. each \$2.75, dis 20 % Drill Chucks. each \$8.00 dis 20 %	E AS
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Tinned Sauce Pans	% B V
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Hiscox File Mfg. Co\$5.00 to £ currency, dis 15 Johnson & Bro\$5.00 to £ currenc Madden & Cockayne File Co\$5.00 to £ cur., dis 15	10 1 10 m
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Limet & Co. (French)	11
H. Disston & Sons (new list). dis 30 Limet & Co. (French). \$4.25 to £ gol Boyton's Cant	94.84
Mrs. Knox, No. 1870. each \$2.75 to \$3.00 ne Knox Imperial, 1877. \$5.20, dls 30&to&10 (Knox, 4-inch Bolls. \$2.50 each ne	200
" 8 " 4.50 each ne Peerless, 4-inch Rolls 4.00 each ne " 5 " 4.75 each ne	2 2 2
Improved Knox (Climax), 4-inch	000
Peerless, 4-Inch Rolls	600
" No. 2, 5-inch Roll 5-00 each ne Crown, 46-in. 1601, \$2.35; 6-in., \$2.75; 8in., 4-00 each ne Domestic Fluter 1.50 each ne	
Combined Fluter and Sad Iron & doz 15.00, dis 10: Fluting Scissors dis 35&10: Forges dis 35&10:	010
Keystone Portable Forge Codis 20	6
Hay, Manure and Spading .dia 35. Plated A I .dis 408.5 Flated & Barton .dis 408.5 Freit and Jelly Presses .dis 20.8 Enterprise Mig. Co .dis 20.8	2000
Burnished, P. S. & W., new listdis 60 5	3
Clauges.	1
Gauges. dis 45&10. Marking. dis 35 Star dis 35 "Smith's Patent ♥ doz \$18.00, dis 40	W 80 00 80
Gimlets. dis 40 gross \$12.00, dis 45 gross \$12.00,	2000
Gimlets	1010101
" Douglass' dis 25&10 Glue Pots. dis 25&10 Tipned and Enameled dis 25&00	2
Family, Howe's "Eureka". dis 25 ' L. F. & C.'s "Handy" dis 25 ' Grindstone Fixtures.	20.00
Glue Pots. Glu	1010101
Humason & Beckley Mfg. Co	20.00
Henry Hammonds' (New list, Jan. 1, '77). dis 15&5 3 Cheney's Steel Face and Claw dis 16 " all Steel dis 20&10 Verree dis 20&10 Cheney's C	20000
Magnetic Tack. dis 25&10 ; Warner & Noble's. dis 10 ; Hand Cuffs and Leg Irons.	
	1
Tower's Hand Cuffs, \$4.00 \(\psi\) pair \(\text{dis 25.9} \) Leg Irons, \$6.50 \(\psi\) pair \(\text{dis 25.9} \) Providence Tool Co.'s Hand Cuffs, \$15.00 \(\psi\) doz \(\text{dis 10.9} \)	
Verree Magnetic Tack. Mis 2525 Magnetic Tack. Mis 2525	-1
Nos 0 1 2 3 4	.1
Nos 0 1 2 3 4	.1
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	Screw Hook and Strap
	Heavy Welded Hook 18 to 12 in., 11 C dis 30
	Screen Hook and Par
6	Screw Hook and Eye (% in. 12960 ne
3	Hoes.
	Socket
.	Grubdis 30 %
	Scovill Patterndis 20 @ 200 30 9
	" Scovill Patterndis 20%5
	Handled Solid C. S. Shank
	Scovill Pattern, Handleddls 35 %
	Bird Cage, Sargent's listdis 60&10 %
	Beltdis 60&10
	Bench—Hotchkiss', \$5,00 ₹ dozdis 10 % Weston's, No. 1, \$8,00: No. 2, \$7,00 ₹ doznet
	" McGill's, \$3.00 % dozdis 10 %
	Clothes Line, Hart's listdis 60&10&5&10 g
1	Bird Case, Sargent's list
	Ceiling Sargent's list
H	Coat and Hat, Hart's listdis 65&5&10 %
H	" Sargent's listdis 60&10&10 %
	Wrought Staples and Hooks and Staplesdis 75 %
	Wire Screw Hooks and Eyes
	Grass. dis 30 % Whiffletree—Patent
1	Grass
1	THE PARTY OF THE P
1	Ausable
1	
1	Cortland "290 260 240 230 220 210 210 210 210 210 210 210 210 21
1	Globe, P't'd and Pol'd " 31c 28c 26c 25c 24c 23c
1	Polished, Pat. Fin " 28c 25c 23c 22c 21c 20c
1	Polished, Ex. Fin " 30c 27c 25c 24c 23c 22c Perkins' P't'd—Black " 26c 23c 21c 20c 19c 18c
1	Perkins' Pointed and
1	
1	Blued
1	Vuican P't'd & Blued " 310 280 200 250 240 230
1	North Western Plain " 30c 27c 25c 24c 23c 23c 24c 25c 24c 23c 24c 25c 24c 24c 25c 24c 24c 24c 24c 24c 24c 24c 24c 24c 24
١	Burden
1	Medium and Heavy
1	Termins Show Face 5.0279
1	The Boston Horse Shoe
1	The Boston Horse Shoe
I	Novelty Ice Breakers
1	Dunlap's Ring Picks
1	Iron Mellet Diek to Head doz 1.85, dis 60&10 %
ı	"Pick in Handle
ı	Kitchen Ice Tongs
١	Rroad W M ACC not
1	Enameleddls 55 %
1	Ames' Rutcher Knives dis 20 %
ı	" Shoe " dis 15 % Bread " # doz \$1.5c, dis 15 % Hay and Straw—"Wadsworth's" dis 26 % Table and Pocket See Cutlery
I	Table and PocketSee Cutlery
١	Knobs. Carriage (Jap'd 8oc. ₹ gross)dis 6o&10 %
ı	K nobs. Carriage (Jap'd 80c. F gross)
ı	### Plush Tip
ı	" Por. Jap'd Same discounts as Door Locks.
١	" " Por
-	Door, Mineral
ı	Ladles. Melting-Hart'sdis 55&10 %
1	Melting—Hart's dis 55&10 %
1	Monroe's Patent # doz \$4.00, dis 20 %
I	TubularNo. o, \$10.00; No. 1, \$12.50 } net
l	Peerless
Ł	Atna. dis 10&10 %
1	#tna dis to&to 7 Yankee dis to&to 8 De Beque dis to&to 8 Police Small, \$7.50; Large, \$9.00, dis 5 5
١	Police Small, \$7.50 : Large, \$0.00, dis 5 %
	Lard Presses.
	Lard Presses. Draw Cut, 14 incheach \$65.00, dis 20 % Enterprise Mg. Codis 20 %
	Lard Presses. Draw Cut, 14 inch
	Land Presses. Draw Cut, 4 inch each \$65.00, dis 20 % Enterprise Mig. Co. dis 20 % Leunon Squeezers. Procelain Lined. P doz \$60.00 net Eureka, Tinned. P doz \$60.00, dis 10 %
	Lard Presses. Draw Cut, 4 inch each \$65.00, dis 20 % Enterprise Mfg. Co. dis 20 % Leunon Squeezers. Porcelain Lined. \$\psi\$ doz \$6.00 net Eureka, Tinned. \$\psi\$ doz \$6.00 net Bunnis? Fatent. No. 1, \$7.50; No. 2, \$1.20
	Lard Fresses. Draw Cut, 14 inch each \$65.00, dis 20 % Enterprise Mig. Co dis 20 % Lemon Squeezers. Porcelain Lined P doz \$10.00, dis 10 % Dunlap's improved P doz \$60.00, dis 10 % Dunlap's improved P doz \$60.00, dis 10 % Dunlap's Improved P doz \$10.00, dis 20 % Lines dis 25&10 dis 25&
	Lard Fresses. Draw Cut, 14 inch each \$65.00, dis 20 % Enterprise Mig. Co dis 20 % Lemon Squeezers. Porcelain Lined P doz \$10.00, dis 10 % Dunlap's improved P doz \$60.00, dis 10 % Dunlap's improved P doz \$60.00, dis 10 % Dunlap's Improved P doz \$10.00, dis 20 % Lines dis 25&10 dis 25&
	Lard Fresses. Draw Cut, 14 inch each \$65.00, dis 20 % Enterprise Mig. Co dis 20 % Lemon Squeezers. Porcelain Lined P doz \$10.00, dis 10 % Dunlap's improved P doz \$60.00, dis 10 % Dunlap's improved P doz \$60.00, dis 10 % Dunlap's Improved P doz \$10.00, dis 20 % Lines dis 25&10 dis 25&
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	Lard Fresses. Draw Cut, 14 inch. Lemon Squeezers. Porcelain Lined. Lemon Squeezers. Porcelain Lined. P doz \$6.00 net Lureka, Tinned. Lureka, Tinned. Lureka, Tinned. Lureka, Tinned. Lureka, Tinned. Lureka,
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	Lard Fresses Draw Cut , 4 inch each \$65,00, dis 20 5 Enterprise Mfg. Co. dis 20 6 Co. di
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30 %	Defiance Adjustable new list dis 25%10 %
net	Ohio Tool Co. dls 35 g Plane Irons, Butcher's. \$5.50 to £ gold
10 % 10 %	" Bailey's Patent
30 %	Defiance new list dis 25% 10 % D. R. Barton Tool Co
30 % 15 % 20 %	" Middletown Tool Co
35 % 35 % 35 %	Plow Bits, Greenfield Tool Codis 10 %
10%	Plow Bits, Greenfield Tool Co
50 %	Eureka Pilers and Nippers
net 10 %	Stanley R. & L. Co.'s Pat. Adjustable
0000	Standard Rule Co.'s New Adjustabledis 60&10 % "Non-Adjustabledis 60&10 % Lohnson's Petern Adjustabledis 60&10 %
10%	Davis' Patent dis 60&10 % Pocket Levels dis 60&10 %
10%	Eureka Digger
0 % % %	Vaughan's Post Hole— 6 in. \$23.60; 7, 8 and 9 in. \$25 per doz
10%	Leed's \$5.00 each, dis 35 % Potato Parers, &c. \$\frac{1}{2}\$ doz \$12.00 net "Saratoga" Peeler and Slicer \$\psi\$ doz \$0.00 net
W 50 01	"Saratoga" Peeler and Slicer.
10	Jap'd Screw. dis 60&10 % Brass Screw. dis 60&10 % Lavid Side. dis 60&10 %
230 230 210	Clothes Line
23C 23C 23C	Douglas Cistern, etcnew list dis
200	" " Rams
18e	Punches. Belt or Drive
190	Pumps Douglas Cistern, etc. new list dis S. & F. new list dis S. & F. new list dis Union Mig. Co.'s Cistern and Pitcher dis 55 % " " " Rams dis 25 % " " " Garden Engines dis 25 % Punches Belt or Drive \$\forall \text{ doz \$2.00; 2.25; 2.50, dis 25 % 25 pring \$\forall \text{ doz \$8.50, dis 25 % \$\forall \text{ dis 15 % } \$\forall \text{ doz \$8.50, dis 25 % \$\forall \text{ dis 15 % } \$\forall \text{ dis 25 % } \$\
23C	Rail. Sliding Door, Wrought Brass * m 40c net iron, Painted. * foot 9c, dis 55&10 %
23C	Railing Door, Wrought Brass. Ph 40e net "Iron, Painted. Proof oc. dis 55& 10 % Barn Door, % 54 and 35 inch. dis 56& 10 % For N. E. Hangers. dis 65& 10 %
216	Cast Steel
12 16 12 16 10	For N. E. Hangers
net	\$5.00 5.50 5.50 6.00 6.00 6.50 Razor Straps.
net 15%	Imitation Emerson @ doz \$2.75, dis 40% Hunt's dis 40% 5 %
10%	Chapman dis to @ 15 % Torrey's dis 20 % Saunder's dis 20 % Saunder's dis 10 @ 15 %
net net net	Rivets. Iron and Tinned
net	Saunder's
5%	Rivet Sets. dis 20 % Road and Levee Scrapers. dis 20 %
55%	44 Amortoon Datont discoled
ery	Rollers. Barn Door. Novelty. Acme (Anti-Friction). Rollers. Manufacturers' List of Sept. 7, 1877.
0%%	Acme (Anti-Friction). dis to % Rope. Manufacturers' List of Sept. 7, 1877. Manifa. dinch and larger * b 14 c
ks.	"% inch & b 14%e
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0%	Rules. Boxwood. Ivory. Chapin's. dis socio dis 40cio 5 Stanley dis cocio dis 40cio 5 Stanley dis cocio 6 Stanley dis cocio 6 Stanley dis cocio 7 Stanley dis cocio 7
net o%	Standard
0000	"Hay Rope \$\frac{1}{2}\text{ inch and larger \$\partial \text{ in } \text{ inch and larger \$\partial \text{ in } inch \$\partial \text{ inch \$\partia
5%	Sal from to to lbs. Sal from Nickel Stand attached. Tailors' Mrs. Potts.
0%	Mrs. Potts Combined Fluter and Sad Iron. per doz \$15.00, dis 15 % Sand Paper. Baeder & Adamson's Flint, or to 14 \$4.25 @ ream
et o %	Sand Paper. Baeder & Adamson's Flint, oo to 1\(\frac{1}{2} \). \(\frac{8}{4} \). \(\frac{2}{3} \) \(\frac{1}{3} \). \(\frac{1}{3} \) \(\frac{1}{3} \). \(\frac{1}{3} \) \(\frac{1}{3} \) \(\frac{1}{3} \). \(\frac{1}{3} \). \(\frac{1}{3} \) \(\frac{1}{3} \). \(\frac{1}{3} \) \(\frac{1}{3} \). \(\frac{1}{3} \) \(\frac{1}{3} \). \
10	" Emery. ♥ ream \$6.50 @ 11.50 } New England, same list as B. & A. Flint
2 20	Common 30 B 16 @ 180 not
o % let	Patent. # b pc net Silver Lake, Russia Flax # b 5c net Silver Lake, Russia Flax # b 5c net # White Cotton # b 5c net # Drab Cotton # b 6c net Raw Hide
3%	Raw Hide
200	Norwich dis 25 % Walker's dis 10 % New Fordered dis 26 %
2 2 2 2	Hammond's Window Springs
SAMA	Samones Startform on Fillows
2 %	Salusage Staters of Filters.
244	Saw Framesper gross \$18.00, dis 15&10 %
sh sh	Spear & Jackson's
× × ×	" Cross Cut. dis 30 % " Hand, Panel, Rip, &c. dis 20 %
ANNA	H. W. Peace's Circulars. dis 25 % Mill, Gang and Mulay dis 25 % Cross Cut. Wood, Hand, &c. 446.
AMMA	E. M. Boynton's Lightning, Cross Cutsdis 50% 5 % One-Man, all lengthsdis 40% 5 % Buck Saws (X Barl. 38 dog 21c dis 40% 10%)
70	"Billet Webs
*	Mill dis 30 % Cross Cut dis 20 % Hand, Panel, Rip, &c dis 20 % H. W. Peace's Circulars dis 20 % dis 20
N N	Nos 101 102 103 104 105 Per doz\$10.00 8.75 10.00 7.50 6.25 net
X	Stillman's Genuine # doz \$4.25 net
M M M	Imitation \$\psi\$ dos \$3.5, dis 25 \) Common Lever Dept dos \$2.0, dis 25 \) Leach's No. 0, \$8.00 \(\) No. 1, \$15.00, dis 15 \(\) Nash's No. 0, \$8.00 \(\) No. 2, \$5.50, dis 20 \(\) 15 \(\) Nash's No. 1, \$8.50 \(\) No. 2, \$5.50, dis 20 \(\) 15 \(\) Hammer, Hotchkiss \$5.50, dis 20 \(\) 16 \(\) 16 \(\) 16 \(\) 18 \(\) 16 \(\) 18
	Hammer, Hotchkiss
RMAN	" Hart's Patent Lever
MMMM	Scales
et	Fairbanks'
et	10we's. dis 20&5 % Chatillon's Grocers' dis 25 % Eureka dis 25 %
st	Howe's. dis 2065 % Chattilion's Grocers' dis 25 % Chattilion's Grocers' dis 25 % Grocers' dis 25 % Chattilion's Grocers' dis 25 % Chattilion's Grocers dis 25 % dis 2
ée e e	Scrapers
MM	Denance Box and Ship. dis 2c& 10 %
MMMMMMM	Grovingence Tool Co
	"Providence Fool Co. dis 15
et et	No. 2dis 45&10 %
36	Flat H'd Iron, list Sept. 1, '75, R. & E. Mfg. Co.dis 60&10 %
MM	Round Head Iron Flat Head Brass, list Sept. 1, 75, Am. Sc. Codls 50 % Flat Head Brass, list Sept. 1, 75, Am. Sc. Codls 55 % Round Head Brass, list Sept. 1, 75, Am. Sc. Codls 55 % Brass and Silver Capped. list March 1, 75dls 40 % Lag or Common Coach, new list Mch. 1, 76, dls 40 % Coach, Patent Gimlet Point, list Jan. 1, 75, dls 40 % Lag of Common Coach 1, rew list March 1, 75, dls 40 % Coach, Patent Gimlet Point, list Jan. 1, 75, dls 40 % Lag of Coach, Patent Giml
N NN	Lag or Common Coach, new list Mch. 1. 70.dis 65@ 70 % Coach, Patent Gimlet Point, list Jan. 1, 75.dis 40@ 50 % Bed
100	45

Machine, Flat Head, Iron, Am. Screw Co. dis Round Head, Iron, " Round Head, Iron, " Grand Head, Iron, " History dis 506 608 Bench, Iron dis 606 608 Bench, Iron dis 506 608 Bench, Iron dis 508 Bench, Iro	Aiken Pocket (Briggs) Patent. dis 2045; Wringers. Per doz Wringers. Per doz Wringers. Per doz with Cog Whels. Sexo, dis 49: " With Cog Whis, No. 2%; smail fam'y size 65:0 " No. 2%	4 Per cent. GERMAN SILVER TUBING.
Solution Section Sec	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Solution Section Sec	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Shood's German Steel, Grass 34 doz \$10.00	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Shood's German Steel, Grass	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Cast Steel	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Cast Steel. dis 75, &c. dis 75, dis 75	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Cast Steel	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Cast Steel. dis 75, &c. dis 75, dis 75	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Cast Steel	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Spiratves. Siding Door, M. W. & Co., list. dis sekrob Patent Roller dis 18 dis 50 dis	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Sherives. Sliding Door, M. W. & Co., list. dis sekrob R. & E. listdis cok Patent Roller	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Sherives. Sliding Door, M. W. & Co., list. dis sekrob R. & E. listdis cok Patent Roller	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Shove Share Shar	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Shove Share Shar	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Shove Share Space Shove Share Shar	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Shove Share Shar	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
Floring and Brass Head, R. & E. list dis 504. Polished Steel dis 504. Slates, Square Frames, Round Cornered, by case dis 504. Spokers dis 604. Spokers dis 604. Spokers dis 604.	S Common Stamped Ware	4 Per cent. GERMAN SILVER TUBING.
For and Brass Head, R. & E. list dis 504. Folished Steel dis 504. Slates. Square Frames, Round Cornered, by case dis 504. Spokes dis 604. Spokes dis 604. Spokes dis 604.	METALS.	6 4
For and Brass Head, R. & E. list dis 504. Folished Steel dis 504. Slates. Square Frames, Round Cornered, by case dis 504. Spokes dis 604. Spokes dis 604. Spokes dis 604.	METALS.	9 4
Square Frames, Round Cornered, by casedis 7square Frames, Round Cornered, by casedis 6skm Spokers.		9 11 12 41 15 16 41 16 41 16 41 16 41 16 41
Spekes.	1	18 01 20 00 STEFI. DUTY Bars Invote Shee
Spekes.	# IRONDuty: Bars, 1 to 114c. P &; Sheet, Band	valued at 7 cents & B., or under, 244 cents, and not above 11, 3 cents & B; or
Spoke Shrves. Defiance Metallic new list, dis 25&11 Iron dis 335&11	g per cent. Pig, \$7 \$\psi\$ ton; Polished Sheet, 3c. \$\psi\$ \$\psi\$	STEEL.—DUTT Bars, Ingots, She valued at 7 cents # B., or under, 244 cents, and not above 11, 3 cents # B., or which a she was a she will be classed as
Irondis 335621	C I TO D.	Bessemer or pneumatic process, of who description, shall be classed as
the classical discountry and a second	Pig Iron—AMERICAN.	American Cast Steel.
Spoke Trimmers. P doz \$10.00, dis 45.00	Gray Forge	Spring. Homogeneous Tire. Machinery (round and square). File.
Stearn's No. 1, \$15.00; No. 2, \$12.00 \$\overline{\text{doz}}\ \text{doz}\ \text{doz}	SCOTCH	Machinery (round and square)
Pouglass' # Goz \$9.00, dis 25210	Coltness. F ton 20.50 @ 27.00	Saw Plate, mill and mulay
Douglass	Bar Iron. American Refined	Chrome Steel.
Britannia	Iron, at mill.	Tool. Chrome Steel. Tool, extra fine. Spring. Machinery. Hammer.
Rogers & Bro., A I	Scrap. Wrought Scrap, from yard ton 22.00 @ 23.00	Machinery. Hammer Gun or Homogeneous.
Rogers Cutlery Co. dis 40&5& Hall & Elton. dis 40&4 Holmes, Booth & Haydens dis 40&4	Bar Iron, from Store.	Fuelish Steel -Payable in gold not
tierman Silver (Hall & Elton). dis 25 Tin (P. S. & W.), Teas. \$1.50 \$\overline{\pi}\$ gross, n	S Common rou: \$\fo \cong \tau \cong \cong \cong \tau \cong \cong\cong \cong \co	Extra Cast
Tin (Cowles Hdw. Co.)		Swaged, Cast Best Double Shear
Stocks and Diesdis 5&10	# 1 to 6 in. 1% and 5-16	" ad quality
" Ax Stone W D Sc dis 25kg	Swedish Iron:	2d quality
Slips # B 10c Sand Stone # B 6c, dis 25k1c Washita Stone No. 1, # B 3cc, nc Washita Stone No. 2, # B 3cc, nc Slips No. 3, # B 5cc, nc Arkansas Stone No. 1, # B 81.55, nc Slips No. 1 # B 81.55, nc Grindstones, Family, Loring's dis 10c Grindstones, Family Loring's dis 10c Grindstones Slips No. 1 # B 82.50, nc Grindstones	Bands—1 to 5x12 to 3-16	" 2d quality
" Slips No. 1, # B 250, B		File Steel, Flat and & Round
" Slips No. 1 \$\Pi\$ \$2.50, in Grindstones, Family, Loring's	t Nos. 10 to 20	" Taper to 4 inch
Stove Polish. Joseph Dixon's	27	ANTIMONY LEAD. DUTY: Pig \$2 \$7 100 Bs; old La
Stove Follows	27.	Spanish
	27	English
Squares. Steel. dis 50 %; full cases, dis 50&10 Iron. dis 50 %; full cases, dis 50 %; full cases, dis 50&10 Iron. dis 50 %; full cases, dis	A monton Cold Polled	Tip Lined Dine
Try Squares and T Bevels	COPPER.—DUTY: Pig, Bar and Ingot, sc; Old Copper, 4c \(\psi \) \(\psi \) Manufactured (including all articles of which Copper is a component of chief value), 45 \(\psi \) ad	ShotDrop 9¼; Buck,
" Improved, Nos. 1 and 2dis 30	valorem. American Ingot	N. P. N. _A, 25c; B, 20c; C, 15c; D, 12c # b.
Winterbottom's Try and Miter dis 20&10 Tacks, Haff Weight, American dis 75&20 Tacks, Haff Weight, American dis 75&20 Full dis 50&20 Haff Swedes dis 50&20 Full dis 20&20 Carpet, Am. and Swedes dis 20&20 Leather Head dis 20 Copper 55c, dis 20 Brads, Haff Weight dis 50&20 Shoe Nails	A waterem. A merican inget	N. P. N. A, 29C; B, 20C; C, 15C; D, 12C Y B. Ti N.—DUTY: Plates, Sheets, Tagger and B; Elecro-galvanized Plates, 2C Y B; Of, not enumerated, 35 per cent. ad. vai Banca Pigs free. Banca, subject to duty Banca Straits. Straits. English F B 7 @ English F B 7 W
" Full "dis 50820 " Half " Swedesdis 65820 " Full " dis 20820 dis 104	Braziers' Copper, ordinary sizes, 16 oz. and	and Pigs free. Banca, subject to duty
Carpet, Am. and Swedesdis 20&20 for cas Leather Headdis 20	Braziers' Copper, 12 oz., \$\psi\$ sq. ft. \tag{p} b 34c Circles less than 84 in. in diameter. \tag{p} b 33c	English
Brads, Half Weight	Segment and Pattern Sheets. # B 30c Locomotive Fire Box Sheets. # B 30c	I C 10x14 12x12 Prime Charcoal
4-8ths and longer, 9c; 3%-8ths, 9%c P B, dis sokto Trunk, Clout and Finishing Nails—	Sheathing Copper, over 12 OK. # sq. ft # h 28c Boit Copper # h 30c Compar Ruttoms # h 30c	I X 10X14 10X12 10X12 Prime Charcoal
Shoe Nalls— 4-8ths and longer, 9c; 3½-8ths, 9½¢ P B, dis zo&to Trunk, Clout and Finishing Nalls— 1½-9½-9½-9½-9½-9½-9½-9½-9½-9½-9½-9½-9½-9½	No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the sq. ft.	40X20) D C 12½X17 " D X 12½X17 "
Tap Borers. Common and Ring. dis 25&10 less' Tap Borers. Enterprise Mfg. Co. dis 200	TINNING. 14X48, by the case	For each additional X add
Tanes, Messuring.	For tinning both sides, double the above amount, O'NEILL'S PATENT PLANSHED COPPER,	Best ed quality
Tapes, Measuring. American Flask and Cap Co	14 and 16 oz. and heavier. ** b 36c By the case. ** b 36c 12 oz. and lighter ** b 39c Boiler Sizes.	I C 10X14 / 1 C 12X12 / \$7.00 6.75 I C 14X20 / TERNE PLATE.
Tea Trays. American Tea Tray Codis 15	7 in., 14x52. 8 in., 14x56. 9 in., 14x60. 14 and 16 oz. and heavier. \$\Phi\$ 38c By the case. \$\Phi\$ 35c (And all sizes not over 20 in. wide.)	Prime Char. 2d qual. 1 C 14x20\$6.50 @ 6.75 6.00 @ 6.371/2
Thermometers. Tin Case		I X 14X20, 9.00 @ 8,75 I C 20X28, 13.50 @ 14.00 13.00 @ 13.50
Tobacco Cutters, dis 20	12 Of Brass.	I X 20X28 @ 19.50 I C 20X20 @ 21.00 I C 14X20 M. F. Brand
All from		1 C 20x20, (@ 21.00 1 C 14x20 M. F. Brand SOLDER No. 1, 11% (@ 12%c; No. SPELTER—DUTY: In Pigs, Bars and
Toe Calks. Winsted	BRASS MANUFACTURERS' PRICE LIST.	Cilcolan coch
P. S. & Wdis 10;		American, cash. Lehigh, on spot. ZINt Dutt: Pig or Block, \$1.50 \(\psi \) 10 2\(4c \) \(\psi \) 5.
Game, Newhouse	All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in300 All Nos. to No. 28, inclusive, and widths over 14 to	Sheete
	All Nos. to No. 28, Inclusive, and Winths Aver 11 10	(*
Mouse, Wood, Choker	All Nos. to No. 28, inclusive, and widths over 14 to 20 in, inclusive	***************************************
Mouse, Wood, Choker. Wood holes, 15 gif 6 Patent Choker (Union Nut Co). Wood holes, 16 gif 18c, ne Round Wire. Wood \$1.50, dis 1 Square Wood \$1.50, dis 1	All Nos. to No. 25, inclusive, and widths over 14 to 20 in, inclusive. 20 in, inclusive 3.62 All Nos. to No. 25, inclusive, and widths over 20 to 30 in, inclusive 3.62 3.62 4.62 5.62	***************************************
Mouse, Wood, Choker (Union Patent Choker (Union Nut Co). P doz holes, 15 @ 16 Nut Co). P doz holes, 16 @ 18c, ne Round Wire. P doz 82.0c to \$2.0c t	All Nos. to No. 25, inclusive, and widths over 14 to 20 in, inclusive	Paper Stock, Old Met
Mouse, Wood, Shoker	All Nos. 10 No. 25, inclusive, and widths over 14 to 20 in, inclusive. 34c All Nos. to No. 25, inclusive, and widths over 20 to 30 in, inclusive. 37c 4cc. \$\Pi\$ advance on each No. above Nos. 28 to 28, inclusive. All Brass thinner than No. 36 is Platers' Brass, at. 50c Sheets 24x8, and all sheets cut to particular sizes and lengths under 90 in, in width wider than 2 in. 37c Printers' Rules. Shoets wider than 30 in. and under 40 in. 45cc 10 in. and over 40 in. 45cc	Paper Stock, Old Met
Lithrops Brick and Plastering	the control of the co	Paper Stock, Old Met
Lothrops Brick and Plastering	Sheets where tana 3 and under 45 in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen Cotton, No. 1 No. 2 White linen rags, No. 1 Colored Mixed woolens.
Lethrope Brick and Plastering. dis no Disston's Brick and Plastering dis so Peace's Plastering dis so Peace's Plastering. dis so Peace's Plastering. dis so Rose's Brick. dis 5 Rose's Brick. dis 5 Reades' Brick. gold, dis so Worrall's Brick and Plastering. dis so dis so Garden. dis 25	Sheets where tana 3 and under 45 in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen Cotton, No. 1 No. 2 White linen rags, No. 1 Colored Mixed woolens.
Lethrops Brick and Plastering. dis no bisston's Brick and Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering. dis 20 Peace's Plastering. dis 20 Rose's Brick. dis 30 Rose's Brick. dis 30 Rose's Brick. gold, dis 20 Worrall's Brick and Plastering. dis 20 Garden. dis 25 Triers.	Sheets where tana 3 and under 45 in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen Cotton, No. 1 No. 2 White linen rags, No. 1 Colored Mixed woolens.
Lethrops Brick and Plastering dis no Disston's Brick and Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Rose's Brick dis 20 Rose's Brick dis 20 Rose's Brick gold, dis 20 Rose's Brick gold, dis 20 Rose's Brick dis 25 Rose's	Circular Sheets, in diam. From 4 in to 14, inclusive, 450 and 50 cm. From 4 in to 14, inclusive, 450 and 50 cm. From 4 in to 14, inclusive, 450 and 50 cm. From 4 in to 14, inclusive, 450 and 50 cm. From 5 cm.	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. cotton, No. 1. No. 2. Colored. Mixed woolens. Soft woolens. Soft woolens. Gunny bagging. Jute Butts Kentucky bagging. Kope cuttings. Kentucky bale rope. Oakum junk, No. 1. No. 2.
Lethrops Brick and Plastering dis no Disston's Brick and Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Rose's Brick dis 20 Rose's Brick dis 20 Rose's Brick gold, dis 20 Rose's Brick gold, dis 20 Rose's Brick dis 25 Rose's	Circular Sheets, in diam. From 4 in to 14, inclusive, 450 and 50 cm. From 4 in to 14, inclusive, 450 and 50 cm. From 4 in to 14, inclusive, 450 and 50 cm. From 4 in to 14, inclusive, 450 and 50 cm. From 5 cm.	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. cotton, No. 1. No. 2. Colored. Mixed woolens. Soft woolens. Soft woolens. Gunny bagging. Jute Butts Kentucky bagging. Kope cuttings. Kentucky bale rope. Oakum junk, No. 1. No. 2.
Lottrops Brick and Plastering. dis no bission's Brick and Plastering. dis so: Peace's Plastering. dis so: Peace's Plastering. dis so: Clement & Maynard's dis so: Rose's Brick. dis 5 Reades' Brick. dis 5 Reades' Brick. gold, dis so: Worrall's Brick and Plastering. dis 20 Adren. dis 25 Triers. dis 25 Writington. dis 25 Vrnilators, Window. Nickel and Gill. P doz \$16.00 @ 818.00	Since s where an so in and over so in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. "cotton, No. 1. "No. 2. White linen rags, No. 1. "No. 2. Colored. Mixed woolens. Soft woolens. Gunny bagging. Jute Butts Kentucky bagging. Waste paper and scraps Kope cuttings. K
Lethrops Brick and Plastering dis no Disston's Brick and Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Rose's Brick dis 20 Rose's Brick dis 20 Rose's Brick gold, dis 20 Rose's Brick gold, dis 20 Rose's Brick dis 25 Rose's	Since s where an so in and over so in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. "cotton, No. 1. "No. 2. White linen rags, No. 1. "No. 2. Colored. Mixed woolens. Soft woolens. Gunny bagging. Jute Butts Kentucky bagging. Waste paper and scraps Kope cuttings. K
Lethrops Brick and Plastering dis no Disston's Brick and Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Peace's Plastering dis 20 Rose's Brick dis 20 Rose's Brick dis 20 Rose's Brick gold, dis 20 Rose's Brick gold, dis 20 Rose's Brick dis 25 Rose's	Since s where an so in and over so in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. "cotton, No. 1. "No. 2. White linen rags, No. 1. "No. 2. Colored. Mixed woolens. Soft woolens. Gunny bagging. Jute Butts Kentucky bagging. Waste paper and scraps Kope cuttings. K
Lethrops Brick and Plastering	Since s where an so in and over so in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. "cotton, No. 1. "No. 2. White linen rags, No. 1. "No. 2. Colored. Mixed woolens. Soft woolens. Gunny bagging. Jute Butts Kentucky bagging. Waste paper and scraps Kope cuttings. K
Lethrops Brick and Plastering	Since s where an so in and over so in	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lethrops Brick and Plastering dis no plastoring dis 20 plastors in prick and plastering dis 20 plastors plastering dis 20 plastering dis 2	Sheets where han 5 in. and ower	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lothrops Brick and Plastering dis no bission's Brick and Plastering dis 20 peace's Brick dis 5 peace's Brick dis 25 peace's Brick gold, dis 20 peace's Brick gold, dis 20 peace's Brick dis 25 peace and Cheese dis 25 peace dis 25 peac	Sheets where the state of the s	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lothrops Brick and Plastering dis so prace's Plastering dis so prace's Plastering dis so prace's Plastering dis so coment & Maynard's dis so knee's Brick dis 50 knee's Brick dis 20 knee	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lethrops Brick and Plastering. dis so: Peace's Plastering. dis so: Rose's Brick. dis 5: Rose's Brick. dis 5: Rose's Brick. gold, dis so: Rose's Brick. gold, dis so: Worrall's Brick and Plastering. dis so: Butter and Cheese. dis 25; Ventilators. Window. Nickel and Gilt. P dox \$16.00 \$ \$18.0. Vises. Vises. do to 160 lbs., 12%c, nee Wilson's (30 to 160 lbs., 12%c, gold Peter Wrights (30 to 160 lbs.	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen "cotton, No. 1. "No. 2. White linen rags, No. 1. Colored. Mixed woolens. Soft woolens. Soft woolens. Gunny bagging. Waste paper and scraps. Kentucky bagging. Waste paper and scraps. Kentucky bale rope. Oakum junk, No. 1. Grass rope. Tarred shaking. "Envelope muslia lined. "Envelope and scraps. No. 1. Soft "No. 1. Soft "No. 1. White Shavings, No. 1. Soft "No. 1. White Shavings, No. 1. Soft "No. 1. White Shavings, part white imperfections, No. 2, best folded sheets. Book Stock. "No. 1, Heavy Stock Book Stock. "Wewpapaper Stock. Prints. Boygu Manilas and Hardwares. Commons. Binders' Board Cuttings. Straw Board Cuttings. Straw Board Cuttings. Straw Board Cuttings. Straw Board Cuttings.
Lethrops Brick and Plastering. dis so: Peace's Plastering. dis so: Rose's Brick. dis 5: Rose's Brick. dis 5: Rose's Brick. gold, dis so: Rose's Brick. gold, dis so: Worrall's Brick and Plastering. dis so: Butter and Cheese. dis 25; Ventilators. Window. Nickel and Gilt. P dox \$16.00 \$ \$18.0. Vises. Vises. do to 160 lbs., 12%c, nee Wilson's (30 to 160 lbs., 12%c, gold Peter Wrights (30 to 160 lbs.	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lethrops Brick and Plastering. dis so: Peace's Plastering. dis so: Rose's Brick. dis 5: Rose's Brick. dis 5: Rose's Brick. gold, dis so: Rose's Brick. gold, dis so: Worrall's Brick and Plastering. dis so: Butter and Cheese. dis 25; Ventilators. Window. Nickel and Gilt. P dox \$16.00 \$ \$18.0. Vises. Vises. do to 160 lbs., 12%c, nee Wilson's (30 to 160 lbs., 12%c, gold Peter Wrights (30 to 160 lbs.	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen. cotton, No. 1. No. 2. Colored. Mixed woolens. Soft woolens. Soft woolens. Soft woolens. Gunny bagging. Jute Butts. Kentucky bagging. Waste paper and scraps. Kentucky bale rope. Oakum junk, No. 1. Grass rope. Tarred shaking. White collar cuttings, all paper. Envelope musilia lined. Envelope
Lethrops Brick and Plastering. dis so: Peace's Plastering. dis so: Rose's Brick. dis 5: Rose's Brick. dis 5: Rose's Brick. gold, dis so: Rose's Brick. gold, dis so: Worrall's Brick and Plastering. dis so: Butter and Cheese. dis 25; Ventilators. Window. Nickel and Gilt. P dox \$16.00 \$ \$18.0. Vises. Vises. do to 160 lbs., 12%c, nee Wilson's (30 to 160 lbs., 12%c, gold Peter Wrights (30 to 160 lbs.	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lethrops Brick and Plastering	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lottrops Brick and Plastering	Sincets where and so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lottrops Brick and Plastering	Sheets where than 3 oil. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lattrops Brick and Plastering. dis so passed in the process of the pastering of the pastering dis so the past	Sheets where than 3 oil. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lottrops Brick and Plastering dis not plasters dis 20 Peace's Plastering dis 20 dis 20 dose's Brick dis 25 dose's Brick dis 25 dose's Brick dis 25 dose's Brick dis 26 dose's Bright and Annealed Nos. 26 dis 26 dose's Bright and Annealed Nos. 26 dis 26 dose's Brick dis 26 d	Sheets where hand so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen
Lottrops Brick and Plastering. dis no plastoring dis polision's Brick and Plastering. dis so Peace's Plastering. dis so Peace's Plastering. dis so Peace's Plastering. dis so Peace's Plastering. dis so Rose's Brick. dis 5 Rose's Brick. dis 5 Rose's Brick. dis 5 Rose's Brick. dis 5 Rose's Brick. gold, dis so Worrall's Brick and Plastering. dis 25 Rottler and Choese. dis 25 Ventilators. Window. Nickel and Gilt. P dox \$16.00 \$18.	Sheets where hand so in. and over	Paper Stock, Old Met (Dealer's Selling Price.) Canvas linen

7	Brass Rods, No. 8 and smaller not less than 2 feet	Blue, Prussian, fair to best
TA X	lengths, 45c.	11 11 11 11 11 11
14.34	not less than 2 feet lengths, oc. Wire and Rods less than 2 feet lengths, special rates.	" Chinese dry, " Ultramarine Brown, Spanish. " Van Dyke. Carmine, 40. Green, Chrome. " in oil. " " in oil. " " in oil.
N.	I Twelve cents per in extra for spooling on 1 in spools.	Van Dyke
100	MISCELLANEOUS. Common Plain Brass Pail Ears	Green, Chrome
XXX	Brass Door Rail	" Paris
76.76	High Brass Scrap16e	Mineral Puints
%	Gilding	Orange Mineral
00	Towns, Not each Interest to be added after thirty	English
00	days.	' in oil
00	Plain to No. 20 inclusive, above ¼ in. to 3 in \$0.40	" Indian dry Rose Pink Sienna, American, Raw " Burnt " " in oil " Raw " Umber, Burnt " in oil " Raw." " in oil " Raw." " in oil " in oil. Vermillion, Chinese English
00	Plain to No. 20 inclusive, above ¼ in. to 3 in	Sienna, American, Raw
sh	Number. Nos. 24, 25, 26, four cents advance on List for each	in oil
p-	Above No. 26, special rates.	Umber, Burnt
00		" Raw
00	4 % "	Vermillion, Chinese
00		" English
00	English, Scotch and Extra Patterns Fancy Tubing	
00	Tuhing Sawed or Cut a to 4 feet long a cents ad-	watte Lead, American, pure
00		White, Paris, English, prime. Yellow Ochre, French
00		" in oil
00	All Mandrel Drawn Tubes under % in., 25 cents per pound advance.	Yellow Chrome
00	SENC STRENG	Vellow Chrome Zinc White, American No. 1, 1
	Plain	" French (Paris)
%	GERMAN SILVER TUBING.	in oil
is is	4 Per cent8s	Linseed, Raw Oils. Boiled
18	9 "	Whale, Crude
	15	Bleached Winter
	19 11	
	STEEL.—DUTY: Bars Ingots Sheets and Colls.	Seal, Extra Refined Lard, Pure Winter, Spring. Cotton Seed, Crude
d	valued at 7 cents & B., or under, 2414 cents; over, 7	" Spring
1e	P B, and 10 % ad val. Railway Bars, 114 cents & B.	Cotton Seed, Crude. Southern Yellow White.
35 h; n.	STEEL.—DUTY: Bars, Ingots, Sheets and Colls, valued at 7 cents & D., or under, 244 cents; over, 7 cents, and not above 11, 3 cents & D.; over 11, 3 cents & D. and 10 % ad val. Railway Bars, 13 cents & D. Railway Bars, in part Steel, 1 cent & D. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as	Neatsfoot, Winter
c.	Bessemer or pneumatic process, of whatever form or description, shall be classed as	Natural Lubricating
		Asphaltum Sundri
00		Benzine
00	Homogeneous. 124cc	
40	Machinery (round and square)	PRA
50	Sheet	
	Sheet	
00	Tool.	
00	Spring	
	Machinery	
	Gun or Homogeneous * 15 14 @ 16c English Steel.—Payable in gold, net.	Hardw
	" Best Cast # b 1734c	Haluw
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Silve, Prusalan, fair to best.	Chalk		-		
" Chinese dry " in oll	Chaik Block Block Dryer, Patent, Am'n. English Flocks Frostings. Glue, White. Sheet				340
" Ultramarine	Dryer, Patent, Am'n	ass't	Cans,	Tobac:	keg, oc
Irown, Spanish	Flocks	*******		are;	90
armine, 40combination price	Glue White				500
reen, Chrome	Glue, White. Sheet Glasters' Points, Zinc. Glum, Copal. Damar. Shellac, English dark. Litharge Pumice Stone, selected Lun powdered.				3 66 440
" Paris	Glaziers' Points, Zinc				90
" in oil " 300; " 450	" Damar				360
range Mineral	" Shellac, English				450
ted Lead, American 8140	Litharus dark.				400
English	Pumice Stone, selected Lun	ps			. a (in 6c)
" in oil asst'd cans, uc : kees stee	Putty, in bladders				234C
" Indian dry100	in bulk				25gC
"Indian dry 10c	in bulk. Rotten Stone, soft, English. Spirits Turpentine. Whiting, Spanish.				8e
" Burnt	Whiting Spanish				360
" in oil					9jC
Imber, Burnt	(ila	196.			
" in oil16 @ 210	FRENCH WIND	OW GL.	ASS.		
Raw3½ @ 7½c	Prices current per	box of	so fee	e.	
ermillion, Chinese	Single Thick.	Hanne			
English72%e, gold	SIZES.	rst.	2d.		-16
English				301.	4th.
Vhite Lead, American, pure dry9190	6 x 8 to 10 x 15	8 7.50	8 6.75	\$ 6.25	
White Paris English prime in bbls ald or aller	11 X 14 to 16 X 24	10.75	7-75 9-75	7.25	7,75
ellow Ochre, French	15 X 36 to 24 X 30	12,25	174.75	9,00	
in oilasst'd cans, iic; kegs, se			11,50	9.75	
ellow Chrome	26 X 37 10 26 X 44	15.00	14.00	16.75	
" in oil	30 X 52 to 30 X 54 30 X 56 to 34 X 56 34 X 58 to 34 X 60	10,00	14.50	12,00	
inc White, American No. 1, dryec	30 X 50 to 34 X 50	17.25	15.50	13,50	
" French (Paris)	36 x 60 to 40 x 60	20.75	18.75		
Cellow Chrome	Double ThickD				
Inseed, Raw	SIZES.	ist.	zd.	3d.	4th.
Boiled P gal. casks, toc. bbl, 65c	6 x 8 to 10 x 15	91210	011.00	A	
Harder Haw P gal Cases, oc. Dbl, 55c	11 X 14 to 16 X 24	13.75	12.50	11.75	10.50
Bleached Winterbbl, 750	18 X 22 10 20 X 30	17.25	15-75	14.00	
Winter unbleached	15 X 36 to 24 X 30	21.00	17.25	14.50	
	26 X 36 to 26 X 44	23,25	21,25	17,25	
eal, Extra Refined bbl, - ard, Pure Winter bbl, 80c	26 x 46 to 30 x 50	24.00	22,50	18.00	
" Springbbi, 8cc	30 X 50 TO 34 X 50	27.75	25.00	21.75	
otton Seed, Crudebbl, 62e	34 X 58 TO 34 X to	29.25	27.75	24,00	
Whitebbl. —					-
eatsfoot, Winter	five inches.	per ne	ox ext	ra for	every
асигал клогисанык	An additional to per cent.	will I	e cha	rged f	or all
sphaltum or	inches in length and not ma	vide. king n	AH Siz	es abo	ove 52
enzine⊬ gal. 16e	inches, will be charged in the	8 uni	ted inc	hesbr	acket.
ard, rure winter	34 x 58 to 34 x to Sizes above 40 x 60—\$10.00 Rive inches. An additional to per cent. Glass more than 40 inches v inches in length, and not ma	29,25 33-25 per be will b vide. king n	27.75 30.00 OX ext be cha All siz tore th	24.00 27.75 ra for rged f res abo an 8r t hes bra	ever
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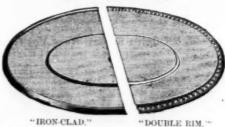


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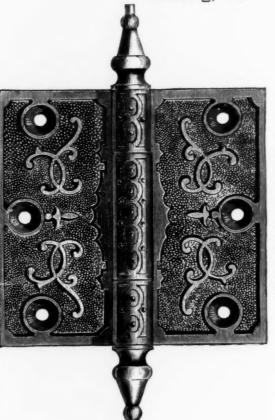
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	Apple Parers—Bay State	
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	Lightning 7	5
	Peach Parers. 7	
	Climar Cores and district the control of	
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	Denis, COW-1 aw s Genuine 65 Braces-Blt, Spofford's Patent dis 50 Brass-Sheets uis 50 Boards-Stove. Brooks' Pat. dis 40 % 4 mos.; 40 % 5 % 30 dis Parlet Botts-Stove dis 40 % 4 mos.; 40 % 5 % 30 dis Parlet Botts-Stove dis 40 % 4 mos.; 40 % 5 % 30 dis Parlet Botts-Stove dis 40 % 4 mos.; 40 % 5 % 30 dis Parlet Botts-Stove dis 50 % 30 dis Parlet Botts-Stove dis 50 % 30 dis Parlet Botts-Stove dis 50 % 30 dis Parlet dis	%
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	Bolts-Stove Pat.dis 40 \$ 4 mos. Mides and	et
	Brick-Bath (box of 9 d	FR
	Botick—Bath (box of 2 doz) Best English dis 59 Can Openers—Sprague's \$10 Cases—Parior Coal Hod. dis 55&10	26
	Cases — Parior Coal Hod. dis 55&10 Chiseis — Firmer Socket. dis 25	18
	Framing Socket	3
	Corner Socket Chicate	3
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	Castings-Malleable	2
١	Castlogs Malleadie dis 60, 10270 Cocks—Globe and Bibb. # 25 7%	*
١	Cocks—Globe and Bibb. # 5 7% Cutters—Meat, "Hales" dis 45; Esg Beaters—" Dover"	ě.
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Block Tin.	11 00
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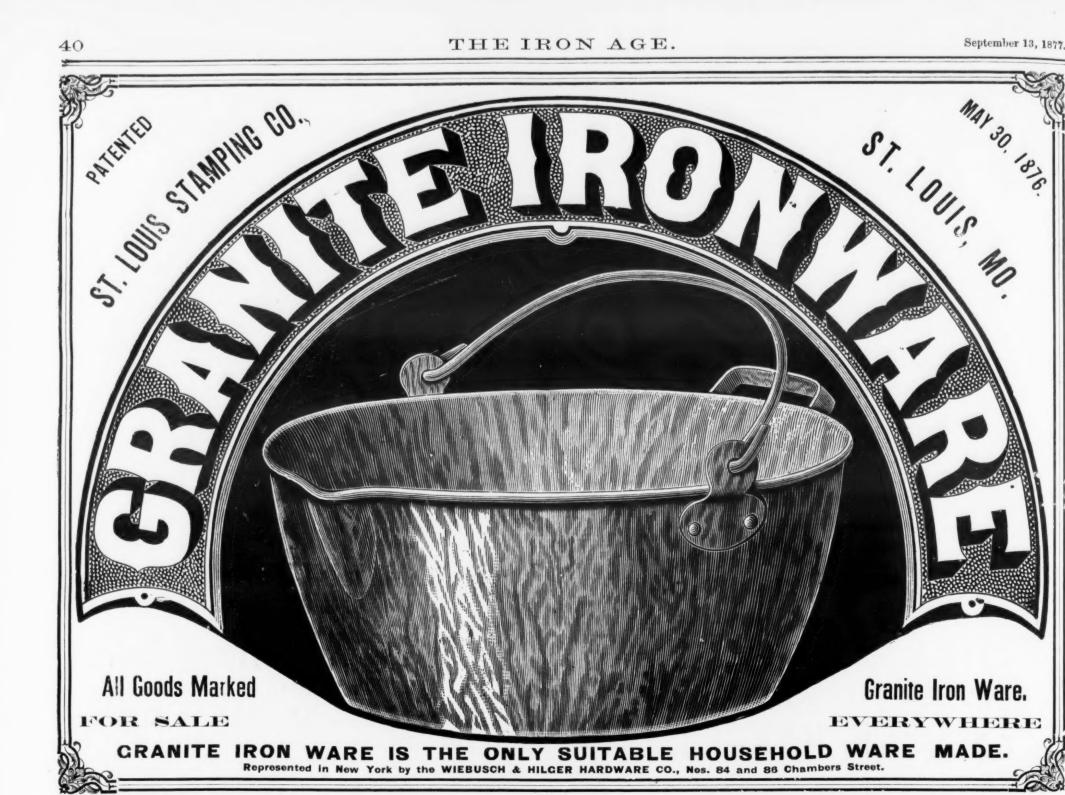
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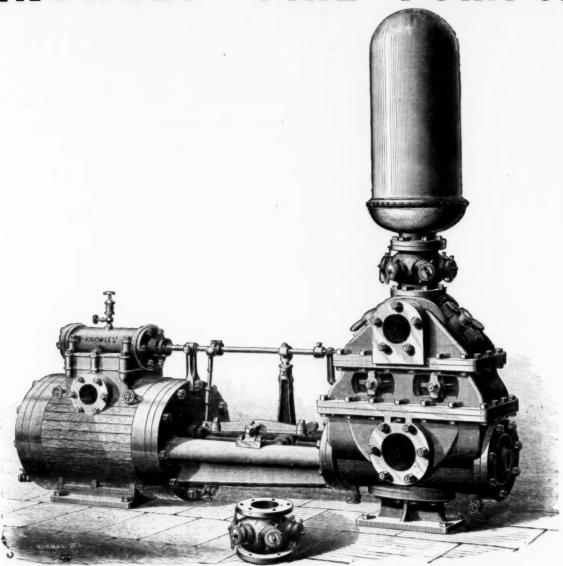


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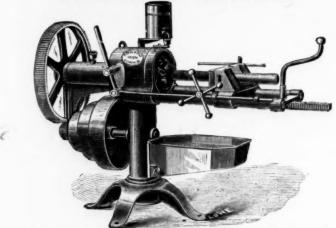


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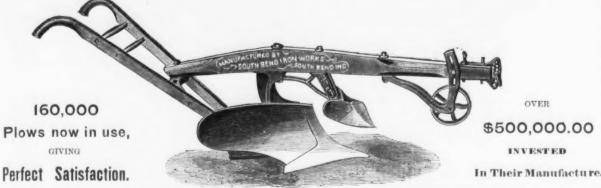
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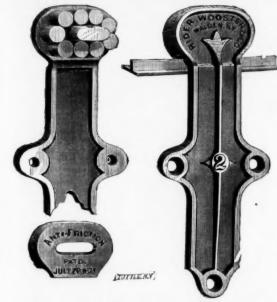
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Common. Snell's qualityeach 3 50 BracesBarber's	Bmiths' Han
Backus'	Grinding bi Sedgeboer's Bradford's F Hammers,—Smiths' Han Handles,—S No. 2 Fork, 4 Ax, Pick, 8le Hny and Co Dedercies 8.
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Saw Frames, with patterns complete. \$\(\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Hay Knive
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Brass Faucets.—L. F. & C	National Par
Butts.—Union Drilled Loose John	Horse Powe Wheeler's Ra
Brass Butts. " Acorn Loose J't dis #58:10 %	Hone,
Brass Butts die Butts and Back Flaps die 30 % Wrought Table Butts and Back Flaps revised list, dis 35 % Wrought Narrow Butts reduced, dis 40 %	Boston Belti
Wrought Narrow Buttsreduced, dts 40 %	Mattocks a Klem, Logar
Curry Cards, No. X, per doz., \$0.35	Money Drag
Wool "No. 8X, "2.50,	Pierpont & C Nails, - Whee Packing, - it
Chinelm.—"Buck Bros." Shank Goods	PackingB
Wrought Narrow Butts. reduced, dis 40 °C Rards. Curry Cards, No. X, per doz., 40 55 dis 30 °C Horse No. X, " 1990 dis 30 °C Wood No. SX, " 250 dis 15 °C Cotton No. 10, " 350 dis 15 °C Cotton No. 10, " 350 dis 15 °C Cartridges." Buck Bros. Shank Goods dis 30 °C Blacks. Buck Bros. Shank Goods dis 30 °C Socket. dis 30 °	Picks, Raffi
Cordage.—Maniia (usuai trade dis.)	Conf
Crow Bars.—Solid Steel	Tamping
Dividers.—Cook s Nickei Plateddis 15 %	PlowsAve
Per doz\$900 12:00 15:00 18:00 24:00	Collins Cast
Dividers	Pol. Stone Tamping Miners Drift Plows.—Avery Solky Collins Cast Pekin Steel. Plow Sulky Post Hole A No. 1, wao
Drills Whitney's with Chucks	No. 1, % uo Pulleyn, —5 ii
Wellfington Mills	4 inch
Nicholson, new list	Pumps.—St. Rakes.—Adv St. Louis Re-
\$1000 s. Tapers, genume, S. in., \$150; 3½, \$158; 4½, \$2.13; 5, \$250	· · · · · · · · · · · · · · · · · · ·
wheeler, Maddell & Gleinson \$150, 35, \$150 \$\frac{2}{3}, 108 \$\$ Stob's I apers, genuine, \$in., \$150, 35, \$150 \$\frac{2}{3},	Renper Kin Geo. Barnes
M., B. & D., solid cast steel, belt face, No. 1	Rond Scrny Cast Pon Saws,—Curt
Hammond-new reduced list	BawsCurt ScythesDi
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Axe Fattern	do. M. Row do. O. Ames
Broad0, \$5' A; 1, \$6'50; 2, \$7'30; 3, \$9'25; 4, \$10'75 5, \$12'75' 6 \$14'75	do. O. Ames Sledgen, -Si
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K. none imp. Extension Silvered Glass & doz \$800	Spaths and Sorghum M Scantila's Se
Guarded, No. 74, (with kerosene oil and candle burners) 5:50	Springs.—Cle Carriage au
Lend Sheet, 9c.; Pipe, 09gc	
Mattocks.	Thimble Sk Vises.—Wilso Wheetbarre Champion W
Snort cutter. "Miles's Chailenge dis 39 % No. 1, 82200 : 2, 83000 : 3, 84000.	
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Pine - Universal Harand Cont all wood	
2 in 🎉 gross \$250; 3 in., 3 50; 4 in., 4 50—dis 15 % Pinnew.—Auburn Tooi Co	St
	(Corrected
American Shear Co new net list	Tin Plate.
Pinte Ware.—Rogers bros	IC, 10x14, Best 1X, 10x14, IC 12x12
Fr'me pol, wh'lpt. face.No. 15,1 ¾ in., 20c.; 16, 2 in., 26c. Pol. wh'l br'zed face No. 115,1 ¾ in., 20c.; 116, 2 in., 26c. Pulley Blocks,—" Bost Boston Make" net	IC, 12x12, 1X, 12x12, IC, 14x21, IX, 14x20,
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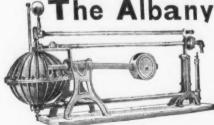
For dimensions of Governor, see Illustrated Price List.



T STATE OF THE STA	234	36:00	41:00	8.25	12
4 1 4 1	236	40:00	45:00	3:50	14
THE C	234	45:00	51:00	3.75	16
and printed	1 3	50.00	57:00	4.25	19
ATT .	336	89:00	67:00	4:50	23
	4	69:00	78:00	5:00	28
(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	436	80:00	90:00	5.50	34
Will beautiful	5	90:00	101:00	6:00	40
	536	105.00	117:00	6.20	46
	6	120:00	133:00	7 00	54
The second secon	7	142 00	156:00	8:00	65
E JUDSON PATENT	8	175 00	192.00	9:00	79
ed Steam Governor.	9	198:00	218:00	10:00	
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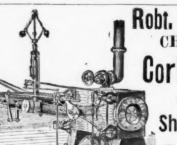
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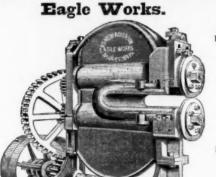
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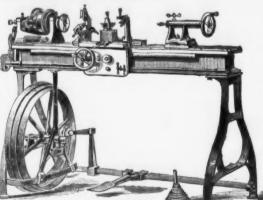
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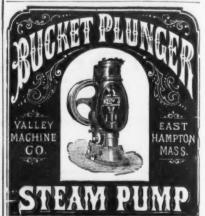
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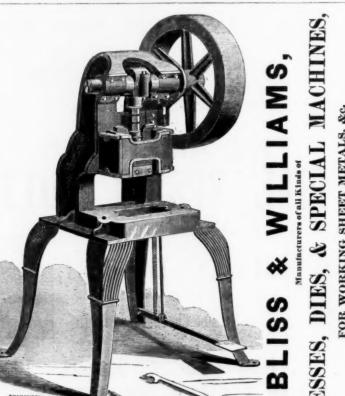
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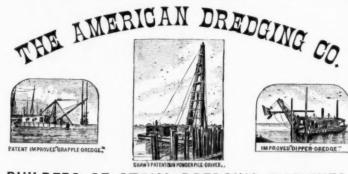
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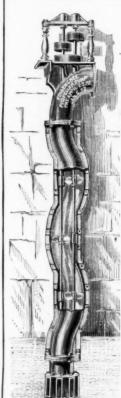


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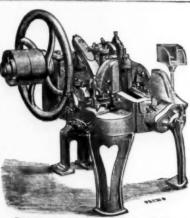
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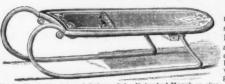
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